Goal-driven evaluations of sustainable products

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Chapter 1

GOAL-DRIVEN EVALUATIONS OF SUSTAINABLE PRODUCTS

1.1. Introduction

Society is currently facing acute environmental problems that call for immediate solutions. Our consumption of food and energy in particular has a serious negative impact on environmental quality (IPCC, 2013; OECD, 2012). To reduce the negative environmental impact of our consumption, various products have been introduced that are claimed to be (relatively) sustainable, among which food products and various energy alternatives. The central question of this thesis is how people evaluate sustainable products and how different factors play a role in this process. By "sustainable products" we mean products that are claimed to be (relatively) sustainable; assessing the actual environmental impact of products is not the aim of this PhD thesis. Provided that products are described as sustainable, we are interested in how people arrive at their evaluations of these products and the evaluation of various characteristics of these products, including perceived environmental impact.

We take a goal-based approach to explain evaluations of sustainable products, with the key premise that people evaluate products positively if they perceive them as facilitating their goals (i.e. as enabling them to fulfil their goals), whereas they do not evaluate products positively (or even evaluate negatively) if they don't perceive them as facilitating their goals. We develop our conceptual framework (to be elaborated below) on the basis of goal theory and value theory (see Figure 1), and we test this framework in a series of studies combining experiments, correlational studies, and a literature analysis. Based on our results, we discuss practical implications for interventions aimed at enhancing positive evaluations of sustainable products.

1.2. A goal-based approach to evaluations of sustainable products

We propose that goals play a key role in the evaluation of sustainable products. Goals have been found to influence how people evaluate various stimuli in their environment (Bargh, 1990; Bargh, Gollwitzer, Lee-Chai, Barndollar, & Trötschel, 2001; Ferguson & Porter, 2009; Kruglanski et al., 2002). When pursuing a certain goal, people tend to evaluate various stimuli based on how well these stimuli facilitate their goal pursuit (Ferguson, 2008; Ferguson & Bargh, 2004; Ferguson & Wojnowicz, 2011; Fishbach, Zhang, & Trope, 2010; Fitzimons & Shah, 2008; Kruglanksi et al., 2002; Moore, Ferguson, & Chartrand, 2011; Seibt, Häfner, & Deutsch, 2007; Sherman, Rose, Koch, Presson, & Chassin, 2003). Accordingly, we predict that sustainable products will be evaluated positively if they are seen as facilitating one's goals, whereas they will not be evaluated positively (or may even be evaluated negatively; Fishbach, Shah, & Kruglanksi, 2004) if they are not seen as facilitating one's goals. An important question is therefore: which goals shape evaluations of sustainable products, and how will they do so? Below, we describe goal framing theory that distinguishes three overarching goals that seem highly relevant for evaluations of sustainable products. "Overarching" means that a goal may have many sub-goals that are specific to this overarching goal and that may guide evaluations. Our framework entails two major steps. First, it defines the factors that determine which overarching goals become dominant in a given situation, thereby making the corresponding sub-goals strong and guiding evaluations of sustainable products most. Second, it explains how goals shape evaluations of sustainable products.

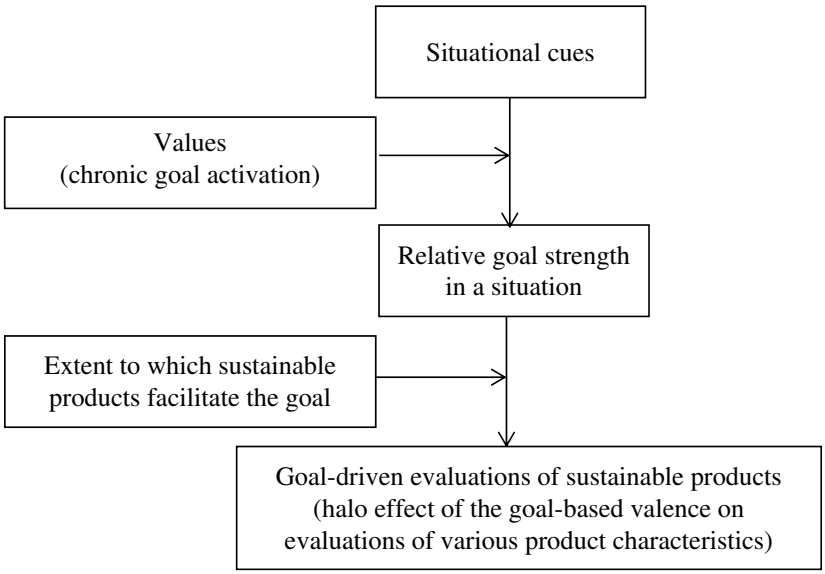

Figure 1. Goal-based approach to evaluations of sustainable products

1.2.1. Overarching goals shaping evaluations of sustainable products

Sustainable products may be situated very differently, and for each situation different goals are likely to play a role for their evaluation. For example, when doing groceries in a supermarket, individuals may have a goal to make an environmentally-friendly choice, or to spend little money, or to treat oneself to something delicious. These goals may have different implications for one's evaluations of "green" products in a supermarket. If these products are seen as indeed good for the environment, people willing to make an environmentally-friendly choice will probably evaluate them positively. However, "green" products are often more expensive than conventional products and may thus be evaluated less positively by people willing to save money. Finally, people willing to indulge themselves may evaluate "green" products positively only if they think that these products are very tasty. Still other goals may apply in other situations. Given a great variety of goals

across situations where sustainable products are available, it is highly relevant to consider overarching goals, which give direction to pursuing situation-specific sub-goals. Goal framing theory offers a distinction into three overarching goals that affect the kinds of sub-goals one will pursue (Lindenberg & Steg, 2007; 2013): hedonic, gain, and normative goals. The overarching hedonic goal makes one focus on preserving and/or improving the way one feels right now. The overarching gain goal is about securing and promoting one's resources. The overarching normative goal is directed towards doing the right thing and acting in a morally appropriate way. Even though the three goals are likely to be chronically activated to some degree, in most cases one of them is more activated than the other two. In that case, it is called a "goal frame" because it then frames the way the situation is perceived and evaluated. The overarching goals contain collections of situation-specific sub-goals. For example, a goal to make an environmentally-friendly choice in a supermarket is a sub-goal of the normative goal, a goal to save money belongs to the gain goal, and a goal to indulge oneself is rooted in the hedonic goal. In the following, when we refer to goals in a given situation, we mean sub-goals of the dominant overarching goal (the goal frame) in that situation. Depending on which overarching goal they belong to, we describe goals in a given situation as hedonic, gain, and normative goals, respectively.

Sustainable products are meant to reduce the environmental impact of our consumption and hence benefit the environment. These products are therefore most likely to be evaluated positively when normative (and particularly pro-environmental) goals (e.g. the aim to protect the environment) are strong in a given situation. However, we will argue and show in this PhD thesis that there is no automatic link between the label "sustainable" and a positive evaluation. The goal process implies that people only evaluate such products positively if they see them indeed as facilitating the pursuit of pro-environmental goals. At the same time, sustainable products may be associated with immediate personal costs, such

as expensiveness and inconvenience. These products are therefore less likely to be evaluated positively when hedonic goals (e.g. to enjoy comfort) or gain goals (e.g. to save money) are strong in a situation. Thus, different aspects of the product could lead to very different kinds of evaluation. The question therefore is what factors determine the relative strength of such competing goals in a situation? And how do goals shape evaluations of sustainable products? We answer these questions below by following step by step our conceptual framework depicted in Figure 1.

1.2.2. Factors influencing the relative strength of goals in a situation

According to goal framing theory, the three overarching goals cover the key motivations of people and hence are all active in a given situation (Lindenberg & Steg, 2007; 2013). However, across situations, each goal might be more or less active relative to other goals. One goal becomes dominant (a goal frame) and drives sub-goals in a given situation, while the other two goals act in the background, either supporting (if compatible) or weakening (if incompatible) the dominant goal (Lindenberg & Steg, 2007; 2013). The hedonic goal is expected to be a priori the strongest, whereas the gain and normative goal may need extra support for increased activation (Lindenberg & Steg, 2007; 2013). We propose that two key factors determine which goals become dominant in a given situation, thereby making the corresponding sub-goals strong and guiding evaluations of sustainable products most: situational cues and individual values.

Situational cues. There is ample evidence demonstrating that exposure to goal-relevant cues makes individuals pursue corresponding goals, a phenomenon called goal priming (Bargh, 2006; Bargh et al., 2001; Kruglanksi, 2002). For example, participants found more words in a word-search task after being primed with achievement-related words (versus control words; Bargh et al., 2001) and became more competitive after being exposed to

business-like objects (versus control objects; Kay, Wheeler, Bargh, & Ross, 2004). With regard to stimulus evaluations, a distinction between goal priming and semantic priming is important (Fishbach et al., 2004; Förster, Liberman, & Friedman, 2007). Exposure to situational cues could affect stimulus evaluations via mere semantic associations, irrespective of what the stimulus means for one's goals. For example, the discussed achievement prime made subjects also evaluate another person higher on achievement-related traits, although this had no implications for their pursuit of achievement goals, which suggests semantic priming (Bargh et al., 2001). Importantly, the (semantic) priming effect on person evaluation was short-lived, whereas the (goal) priming effect on performance in a word-search task was longer-lasting (Bargh et al., 2001). Indeed, it has been concluded in priming literature that semantic priming effects can only occur immediately after the prime and are typically short-lived, whereas goal priming effects are longer-lasting and may even increase in strength over time (unless the goal is achieved; Förster et al., 2007).

In practice, evaluations of sustainable products are typically seen as a result of purely semantic associations (i.e. not linked to goals). For example, it is expected that people associate "green" with "good" and hence will evaluate sustainable products positively. The same semantic association is assumed to be prominent for everyone and to apply to all kinds of products. However, even if such a semantic link between "green" and "good" exists, it needs to be primed in a situation in order to influence evaluations of sustainable products. And even then it will only have short-lived effects on evaluations of sustainable products, which is typical for semantic priming effects. Therefore, we do not consider semantic priming effects as a valuable basis for explaining evaluation of sustainable products and for developing interventions. We are particularly interested in *goal* priming, which has longer-lasting effects on evaluations of sustainable products.

Therefore, it is important to study which goals are primed in a given situation and how they affect evaluations of sustainable products. But how can we know whether goal-relevant cues, including those we use in our studies, indeed prime goals rather than solely semantic associations? To be more precise, in case a prime has elicited short-lived semantic priming effects, can we expect the same prime to also elicit goal priming effects, which will remain longer? Some scholars have abandoned the "either semantic or goal" approach in favour of the implicit assumption that one and the same prime could simultaneously trigger both purely semantic associations as well as goals (Bargh, 2006; Bargh et al., 2001; Fitzimons, Chartrand, & Fitzimons, 2008). However, we know of no attempts to explicitly test this assumption. If semantic and goal priming can indeed occur simultaneously, one should be able to observe both short-lived semantic priming effects and longer-lasting goal priming effects after the same prime and in the same sample. We test this assumption in Chapter 2. If we find support for this reasoning, we have strong evidence to suggest that situational cues can prime goals irrespective of the purely semantic associations that may be triggered by the same cues.

Individual values. We propose that another factor that influences the relative strength of goals in a situation is individual values. Values are defined as "desirable transsituational goals, varying in importance, that serve as guiding principles in the life of a person or other social entity" (Schwartz, 1992, p. 21). As such, values reflect overarching goals (see Hitlin & Piliavin, 2004). However, in value theory, the goal dynamics (such as the relative strength of chronically activated overarching goals) is often left implicit.

When explaining environmentally sustainable beliefs, attitudes, and behaviour, self-enhancement and self-transcendence values turned out to be particularly important (De Groot & Steg, 2008; Nordlund & Garvill, 2002; Steg & De Groot, 2012; Stern, 2000; Stern, Dietz, & Guagnano, 1998). Self-enhancement values, if strong, imply a primary

focus on securing and promoting one's personal resources (e.g. wealth, status), and have mostly been studied as egoistic values in the environmental domain. As acting pro-environmentally often requires giving up (short-term) personal interests, egoistic values typically correlate negatively with pro-environmental attitudes, beliefs, and behaviours. Recently, hedonic values were introduced as another important type of self-enhancement values in the environmental domain (Steg & De Groot, 2012; Steg, Perlaviciute, Van der Werff, & Lurvink, in press). Hedonic values shift the focus particularly to personal pleasure and comfort, thereby inhibiting environmentally sustainable beliefs, attitudes, and behaviours whenever acting sustainably is associated with salient negative hedonic consequences. Self-transcendence values, on the other hand, are focused on collective consequences. Two types of self-transcendence values have been distinguished in the environmental domain: altruistic values, which imply prioritising the well-being of other people and the collective, and biospheric values, which imply prioritising the quality of nature and the environment. Although both altruistic and biospheric values typically correlate positively with environmentally sustainable attitudes, beliefs, and behaviour, biospheric values appeared to be a better predictor in this respect, especially if societal and environmental interests are in conflict (De Groot & Steg, 2008; Nilsson, Von Borgstede, & Biel, 2004; Steg & De Groot, 2012; Steg, Dreijerink, & Abrahamse, 2005).

Values are universal and relatively stable in time (Schwartz, 1992; 1994; Schwartz & Bardi, 2001; Schwartz & Bilsky, 1987; 1990). Yet, individuals differ in how important they see certain values relative to other values (i.e. value strength differs), which then defines how likely they are to act in accordance with different values across situations (Steg, 2012; Steg & De Groot, 2012). Individual value strength can predict a wide range of person's attitudes, beliefs, and behaviours (Maio & Olson, 1994; 1995; Rohan, 2000; Rokeach, 1973; Schultz, 2001; Steg, De Groot, Dreijerik, Abrahamse, & Siero, 2011). For

the current research, particularly evidence of values shaping stimulus evaluations is interesting: respondents expressed more positive evaluations and stronger preferences for choice alternatives that were more (versus less) instrumental for the pursuit of their important values (Feather, 1995; Feather, Norman, & Worsley, 1998; Steg et al., 2012).

So, values are an overarching construct and the strength of values differs across individuals. But how can we link values to people's goals in a given situation and, eventually, to their goal-driven evaluations of sustainable products? Notably, egoistic, hedonic, altruistic, and biospheric values correspond strongly to the three overarching goals distinguished by goal framing theory. That is, egoistic and hedonic values share the same foci as, respectively, the gain and hedonic goals. Altruistic and biospheric values are in fact both normative goals, but the key criterion of "appropriate" conduct of the former is the well-being of others and it is quality of the environment for the latter[a]. This allows us to integrate value theory and goal theory to suggest that values should be seen as chronically activated overarching goals. If an overarching goal is strongly chronically activated, that is, if it is an important value to a person, it is apt to dominate the other two overarching goals in a given situation. Accordingly, certain sub-goals are more likely to be prominent in a given situation if a person endorses a particular value. This suggests that values and situational cues interact in their joint effect on the relative strength of goals in a given situation, and we will elaborate on this in the following paragraph.

[a] Besides self-enhancement and self-transcendence values, the universal value theory distinguishes another value dimension, namely conservatism (i.e. tradition, security) versus openness to change (i.e. stimulation, self-direction; Schwartz, 1994). These values, however, were found to be less predictive of environmental beliefs, attitudes, and behaviours than self-enhancement and self-transcendence values (see Steg & De Groot, 2012). We think that while self-enhancement and self-transcendence values may define which goals are important to people, conservatism and openness to change values may define the way in which people wish to pursue their important goals. It has indeed been proposed in value theory that some values are important goals and other values are means to these goals, as seen from a distinction between goals (terminal values) and modes of conduct (instrumental values; Rokeach, 1973; see Rohan, 2000 for an extensive review of value theories). This question, however, is not central to the current thesis, and therefore we will not further discuss the conservatism versus openness to change value dimension.

The interaction between situational cues and values. We argue that the relative strength of goals in a situation depends on the interaction between situational cues that prime goals and individual values, that is, chronically activated overarching goals (see Lindenberg & Steg, 2007; 2013; Steg, Bolderdijk, Keizer, & Perlaviciute, in press). Specifically, situational cues can strengthen goals the more, the more strongly people endorse a relevant value. It has indeed been found that cues in a situation can strengthen (or weaken) the influence of values on individual perception and conduct, in comparison to other values. For example, Maio, Pakizeh, Cheung, & Rees (2009) experimentally primed self-transcendence or self-enhancement values (by embedding value-related words in scrambled word sentences or by pairing them with positive adjectives; experiments 2-5) across a range of situations and found that participants responded more in a way aligning with the primed values and less in a way opposing the primed values when compared to the control prime condition. Interestingly, providing reasons for (self-transcendence) values was found to be more likely to result in value-corresponding responses than reading value-related words or rating one's feelings about certain values (Maio, Olson, Allen, & Bernard, 2001). This suggests that the observed priming effects were indeed goal-driven rather than based on mere semantic associations: for semantic effects it should not matter whether they are triggered by semantically-related words, emotions, or reasons, whereas particularly considering reasons for goal pursuit is likely to strengthen goal priming effects. A related study in the environmental domain found that when consequences of pro-environmental behaviour for self-transcendence values were made salient (i.e. stressing environmental benefits of car-sharing), participants were more likely to engage in another pro-environmental behaviour (i.e. recycling) than when consequences of pro-environmental behaviour for self-enhancement values were made salient (i.e. stressing financial benefits of car-sharing; Evans et al., 2013). Furthermore, priming environmental values made

participants choose a more (versus less) environmentally friendly television set, but only if environmental values were central to an individual (i.e. incorporated as part of the self; Verplanken & Holland, 2002, experiments 1-3). Together, these results show that situational cues can activate a particular value and strengthen corresponding goals, more likely so if the value is strong. Another way of saying this is that a strong value makes people more sensitive to certain cues, which, in turn, further activate the value.

Building on the above findings, we propose that explicit primes (e.g. exposure to value-related words) may not be necessary in order to activate values and strengthen the corresponding goals. We derive this from the assumption that an overarching goal that is strongly chronically activated may not need strong primes to become dominant and drive sub-goals in a given situation. There is some initial evidence that explicit value primes may not be necessary and more subtle cues in a situation can already activate values and strengthen the corresponding goals. For example, value incongruent behaviour in the past, increased self-focus, and value-relevant contexts such as voting behaviour made respondents act upon these values, as long as these values were central to them (Verplanken & Holland, 2002, experiments 4-6). This is likely to have important implications for evaluations of sustainable products. Given that sustainable products signal possibilities for the pursuit of pro-environmental goals, they may already serve as cues priming these goals, provided that people strongly endorse biospheric values. In Chapter 3, we test the hypothesis that pro-environmental products as such can prime pro-environmental goals and elicit goal-driven product evaluations for people with strong biospheric values.

Importantly, sustainable products may not only have salient implications for normative pro-environmental goals, but also for gain (e.g. to save money) or hedonic (e.g. to enjoy comfort) goals. That, along with the above proposition that products can serve as

goal primes, opens the door for an intriguing possibility that the same products could prime different goals for people with different values. Specifically, certain goals are more likely to be prominent for people if they endorse a relevant value, and people may therefore attend particularly to the aspects of products that have implications for their value-based prominent goals. For example, someone with strong biospheric values will have prominent normative goals that relate to the environment (e.g. to protect the environment) and hence attend particularly to the environmental aspects of a given product. Even if exposed to the same product, someone with strong egoistic values will be more likely to have prominent gain goals (e.g. to save money) and attend to other product aspects that have implications for particularly these goals (e.g. price). This could result in different evaluations of sustainable products, depending on how well these products facilitate the pursuit of one's dominant goals. The possibility that the same product primes different goals and generates different goal-driven evaluations for people with different values has so far not received explicit attention in the literature. We explore it explicitly in Chapters 4 and 5.

1.2.3. The effects of goals on evaluations of sustainable products

So far, we argued that situational cues and individual values determine the relative strength of goals in a given situation. The next question is how goals shape evaluations of sustainable products. We propose that goal-driven evaluations depend on the extent to which products are seen as facilitating one's goal pursuit. Subsequently, we argue that the goal-based valence can cause a halo effect and colour evaluations of various specific product characteristics. We explain these propositions below.

The extent to which sustainable products facilitate one's goal. Different from the effects of purely semantic associations, the effect of goals are sensitive to the possibilities for goal pursuit. For example, water is more effective for quenching thirst than coffee and, indeed,

only the former and not the latter drink was evaluated more positively by thirsty participants (compared to not thirsty participants; Ferguson & Bargh, 2004). Thus, although coffee could be semantically categorized as "beverage" and hence linked to "thirst", the extent to which it can actually quench thirst was what drove the evaluation. In another study, although all being "foods", only breakfast foods but not dinner foods were evaluated as more attractive by hungry than not hungry participants when tested in the morning, whereas the same effects were found for dinner foods but not for breakfast foods when tested in the evening (Markman, Brendl, & Kim, 2007). Accordingly, we propose that even if people have strong pro-environmental goals, they may not evaluate sustainable products positively, if these products are not seen as facilitating the pursuit of pro-environmental goals. For example, despite consumers' strong pro-environmental goals, if they see a product as facilitating hedonic goals, they are not likely to judge it as suitable for attaining normative (pro-environmental) goals, even if it is described as "sustainable". We test this hypothesis in Chapter 3. Next, in Chapters 4 and 5, we look at whether the same products are indeed evaluated differently, depending on the extent to which these products facilitate people's different goals.

Halo effect of the goal-based valence. We reason that people evaluate sustainable products based on the implications of these products for their goal pursuit. But how far reaching are the effects of goals on product evaluations? So far, goals have been found to guide preference for a stimulus (Brendl et al., 2003; Chartrand et al., 2008; Nisbett & Kanouse, 1969), perceived attractiveness of a stimulus (Brendl, Markman, & Messner, 2003; Markman et al., 2007), automatic valence of and affect towards a stimulus (Ferguson & Bargh, 2004; Fishbach et al., 2004; Moors, De Houwer, & Eelen, 2004; Seibt et al., 2007), and approach versus avoidance tendencies towards a stimulus (Krieglmeyer, Deutsch, De Houwer, & De Raedt, 2010; Moors & De Houwer, 2001; Seibt et al., 2007).

All these dependent variables reflect an overall positive (e.g. “excellent”) or negative (e.g. “disgusting”) judgement, based on the implications of a stimulus for one’s goal pursuit. But could goals influence evaluations of specific stimulus characteristics that are not directly relevant for one’s goal pursuit? For example, in the study reported earlier, would the extent to which drinks can quench thirst also influence the perceived tastiness of these drinks, particularly among thirsty participants (Ferguson & Bargh, 2004)? There is some initial evidence to suggest that if people like a stimulus, they tend to ascribe more positive characteristics and fewer negative characteristics to it in general, whereas if they dislike a stimulus, they tend to ascribe more negative and fewer positive characteristics to it (Alhakami & Slovic, 1994; De Groot, Steg, & Poortinga, 2012; Poortinga & Pidgeon, 2005). Accordingly, we suggest that next to goal effects, there is also a halo effect. Goal dynamics drives the initial valence, and the valence, in turn, drives the halo effect. In this way, characteristics that are not explicitly linked to the goal still enter the evaluation. Thus, if certain drinks are not very good for quenching taste, they may be evaluated as also not tasty by thirsty participants, and even improving the taste of these drinks will not change their evaluation. This conclusion, while trivial in this example, might be vital in other situations. For example, as we describe in Chapter 5, “haloed” evaluations of energy alternatives (e.g. nuclear energy, renewable energy sources) could potentially make interventions addressing these evaluations ineffective. Specifically, if some positively or negatively evaluated characteristics are not particularly important to people but are merely coloured by the goal-based valence, they are probably not the key drivers of acceptability of energy alternatives. Addressing these evaluations in intervention strategies (e.g. reducing energy prices) may therefore not have the expected impact on public acceptability of energy alternatives. In this PhD thesis, we study such possible halo effects of the goal-based valence on evaluations of sustainable products (Chapters 3 and 5).

1.3. Synopsis of the various studies

We test our assumptions about goal-driven evaluation of sustainable products (see Figure 1 for the conceptual framework) by the means of experimental studies (Chapter 2 and 3), a literature analysis (Chapter 4), and correlational studies (Chapter 5).

Chapter 2 revolves around the influence of situational cues on the relative strength of goals in a situation and, particularly, delves into the conceptual and empirical distinction between goal and semantic priming. Even if situational cues are associated with specific goals and hence can potentially prime these goals, they may also trigger purely semantic associations, which have nothing to do with goals. But how does this work in practice, when exposing people to situational cues? Are semantic and goal priming effects mutually exclusive, with either one or another guiding individual perception and conduct, or can they exist in parallel? These questions are vital for the study of goal-driven evaluation of sustainable products, which requires that even if situational cues trigger purely semantic associations, goals are likely to also be activated and to guide evaluation over and above mere semantic associations. We aim to answer these questions in experimental studies that will be reported in Chapter 2.

The goal in Chapter 3 is to test the proposed conceptual framework that explains evaluations of sustainable products (see Figure 1). As a case in point, we focus on the evaluation of food products that are claimed to have pro-environmental qualities. It is typically expected that people with strong pro-environmental goals will evaluate these products positively. But is that the case? Our conceptual framework posits that pro-environmental goals are strong if primed by situational cues and supported by strong biospheric values. We expect that, when described as pro-environmental, products by themselves can serve as subtle cues that prime pro-environmental goals, provided that

people strongly endorse biospheric values. To test this assumption, we examine whether an explicit pro-environmental prime indeed has no additional effect on the relationship between values and product evaluations. The most important question then is whether people with strong biospheric values, when compared to people with weak biospheric values, evaluate pro-environmental food products more positively. That depends, according to our conceptual framework, on the extent to which products are seen as facilitating pro-environmental goals. We propose that the more pro-environmentally labelled products can be taken to facilitate pro-environmental goals, the more positively they will be evaluated. We distinguish between virtue products, which are generally seen as fulfilling normative goals (health, environment, etc.) and are seen as more suitable for attaining pro-environmental goals than vice products, which are generally seen as fulfilling hedonic goals (e.g. indulgence). In addition, we study the influence of biospheric values on evaluations of various product characteristics that may not all be directly relevant for pro-environmental goal pursuit. If a halo effect of the goal-based valence exists, stronger biospheric values should colour evaluations of various product characteristics positively, but only if the product is seen as facilitating pro-environmental goals.

An intriguing possibility derived from our conceptual framework is that the same product could prime different goals for different people, depending on people's values. In other words, values have the power to define which goals will guide evaluations of sustainable products, and how they will do so. Chapter 4 and Chapter 5 aim to explore this notion. This time, we focus on the evaluation of energy alternatives. Various energy alternatives have been promoted as (relatively) sustainable, for example renewable energy and nuclear energy. Most importantly for our theory, energy alternatives typically have salient implications for different goals, for example, normative and gain goals. Accordingly, we expect that different goals may potentially be primed by energy

alternatives, and it depends on people's values which type of goals will be primed most strongly and guide the evaluations of these alternatives most strongly.

To test the above reasoning, we first look at the existing literature for evidence of possible goal and value effects on evaluations of energy alternatives. If energy alternatives could indeed prime different goals on the basis of people's values, we should be able to find support in the literature for our claim that objective qualities of energy alternatives alone cannot (fully) explain evaluations of these alternatives. Most importantly, we review studies on the relationships between people's values and their evaluations of energy alternatives. This relationship (as explained in our conceptual framework) should be able to explain why the same energy alternatives (which, possibly, represent cues to different goals) might have been found in the literature to be evaluated positively by some people and less positively (or even negatively) by others. Specifically, we expect to find across studies that people evaluate positively energy alternatives that facilitate the goals that are prominent to them on the basis of their values. Conversely, we expect that energy alternatives that do not facilitate people's value-based prominent goals will not be evaluated positively (or even evaluated negatively). Next, we look at whether there is any indication of a halo effect of the goal-based valence. That is, whether values can colour evaluations of characteristics of energy alternatives that are not necessarily important to people in the light of their values.

In Chapter 5, we empirically test our assumption about the power of values in defining goal-driven evaluations of energy alternatives. We purposely select energy alternatives that, while promoted as sustainable, have different implications for normative and gain goals, and assess evaluations of these energy alternatives as a function of values. If energy alternatives indeed prime different goals on the basis of people's values, we should observe systematic differences in the relationship between various values and

evaluations of the selected energy alternatives. Specifically, we expect to find positive relationships between values and evaluations of energy alternatives that facilitate value-based prominent goals, whereas we do not expect positive relationships between values and evaluations of energy alternatives that do not facilitate value-based prominent goals. Next, we explicitly study whether values can colour the evaluations of characteristics of energy alternatives that are not directly relevant for one's goal pursuit (i.e. not particularly important in the light of one's values). Finding such a result would provide additional support for the hypothesis on a halo effect of the goal-based valence on product evaluations.

In Chapter 6, we discuss the main findings of this PhD thesis and link them to the proposed conceptual framework that explains goal-driven evaluations of sustainable products (see Figure 1). We discuss theoretical implications of this work, both for goal theory and value theory, and we generate important questions for future research. Based on our results, we provide practical implications for enhancing positive evaluations of sustainable products.

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Chapter 2

PARALLEL PRIMING: CAN BOTH SEMANTIC AND GOAL PRIMING EFFECTS OCCUR AFTER THE SAME PRIME AND IN THE SAME PERSON?

Abstract

Two kinds of priming effects have been distinguished in literature, namely semantic priming effects, which refer to increased accessibility of semantically-related concepts, and goal priming effects, which refer to induced motivation to pursue prime-relevant goals. This research tested whether both kinds of effects can issue from the same prime and in the same person, which we conceptualized as parallel priming effects. Across two experiments using different primes, we first found short-lived semantic priming effects and afterwards longer-lasting goal priming effects, which indicated parallel priming. In addition, we found that goal priming effects failed to show up unless a situation suitable for the primed goal pursuit was provided. This demonstrates that parallel priming effects can only be detected under right conditions. The current findings suggest that diverse priming effects may occur after the same prime and in the same person due to parallel priming, but they require a thorough experimental design in order to be disclosed.

Keywords: delay; goal applicability; goal priming; parallel priming, semantic priming.

2.1. Introduction

After an exposure to the American flag, subjects reported more support towards republicanism (Carter, Ferguson, & Hassin, 2011), after reading words related to the elderly stereotype, participants walked more slowly (Bargh, Chen, & Burrows, 1996), and after seeing objects like business suits, subjects became more competitive (Kay, Wheeler, Bargh, & Ross, 2004). This illustrates how exposure to cues, or priming, affects one's preferences and performance (Bargh, 2006; Förster, Liberman, & Friedman, 2007). But what causes such effects? Literature suggests that a prime may either increase accessibility of semantically relevant concepts, which is referred to as semantic priming, or induce motivation to pursue prime-relevant goals, referred to as goal priming (Bargh, 2006; Bargh, Gollwitzer, Lee-Chai, Barndollar, & Trötschel, 2001; Förster et al., 2007; Kruglanski et al., 2002). Although semantic priming might trigger prime-corresponding behaviour, and thus yield similar effects as goal priming at a certain moment (e.g. reporting more support towards a political party just after the prime; see Bargh et al., 1996; Dijksterhuis & Bargh, 2001), only goal priming can result in longer-lasting and persistent goal pursuit (e.g. voting for a political party in actual elections later after the prime; see Chartrand & Bargh, 1996; Bargh et al., 2001). But how can we know when a given prime will elicit semantic priming effects and when it will elicit goal priming effects? Even more important is the question whether the same prime may have both kinds of effects at the same time. This is far from just a conceptual question of distinguishing the two kinds of effects. If semantic and goal priming effects can issue from the same prime in the same situation, priming effects in general may be more diverse than often anticipated. For example, in one study, the elderly prime triggered slow walking behaviour and it was suggested that such behaviour priming resulted from semantic concepts being closely related to motor representations (Bargh et al., 1996). According to behavioural priming

models, activation spreads from primed concepts to the associated behaviour: “Perceptual inputs are translated automatically into corresponding behavioural outputs” (Dijksterhuis & Bargh, 2001, p. 1). In another study, the same prime made participants walk faster as if, according to the authors, they had an active goal to get away from the elderly (Cesario, Plaks, & Higgins, 2006; for a similar line of reasoning, see Cesario, Plaks, Hagiwara, Navarrete, & Higgins, 2010). Indeed, only participants who had negative attitudes towards the elderly walked faster after the prime. This however resembles a motivational phenomenon in which the value function of a certain activity plays a significant role (see Förster et al., 2007). Following our reasoning, if semantic and goal priming effects were to issue from the same prime, the very same prime could produce priming effects going into different directions! That is, the semantic prime would imply slow walking for everybody because of the semantic association, whereas the (here negative) value attached to the group of elderly people would, in contrast, increase walking speed. When the semantic prime loses its power (which usually happens quickly; for a review see Förster & Liberman, 2007), the goal priming effect could still be active, influencing behaviour later in time. In the current research, we explore the possibility of such diverse priming effects, which we conceptualize as parallel priming. After the same prime and in the same sample, we expect to observe semantic priming effects, occurring immediately after the prime and fading away quickly, as well as goal priming effects, which would last longer. Next, we propose that parallel priming effects may remain undetected unless the situation is suitable for the primed goal pursuit. We elaborate on our propositions below.

2.1.1. Semantic versus goal priming effects: Differences across time

In early studies on semantic priming, after reading a certain word (e.g. *bird*), participants were quicker in recognizing semantically related words (e.g. *robin, canary*) than semantically unrelated words (e.g. *arm*; Neely, 1977). Many follow-up studies confirmed

that primed concepts facilitate accessibility of semantically related knowledge (for reviews, see McNamara, 2005; Neely, 1991). Next, semantic priming was found to trigger semantically related judgments. For example, after exposure to negative versus positive primes, participants were quicker in judging the valence of, accordingly, positive and negative target words (e.g. Bargh, Chaiken, Govender, & Pratto, 1992; Fazio, Sanbonmatsu, Powell, & Kardes, 1986; Greenwald, Klinger, & Liu, 1989). Studies on impression formation demonstrated over and again that priming personality traits (e.g. *adventurous* versus *reckless*) activated a semantically related category (e.g. *positive* versus *negative* traits) and resulted in judging another person more in the direction of that category (e.g. Bargh, Bond, Lombardi, & Tota, 1986; Higgins, Rholes, & Jones, 1977; Srull & Wyer, 1979). Overall, in case of semantic priming, the lexical meaning of the primed concept is processed and linked to other concepts with a relevant lexical meaning (for theories explaining processes behind semantic priming effects, see McNamara, 2005). Most importantly, semantic priming effects are typically short-lived: they tend to show up immediately after the prime and decrease in strength as a function of an increasing time delay between the prime and the dependent measure (Bargh, Lombardi, & Higgins, 1988; Förster & Liberman, 2007; Förster et al., 2007; Higgins, Bargh, & Lombardi, 1985; Higgins & Brendl, 1995; Srull & Wyer, 1979).

By contrast, in case of goal priming, the functional meaning of the primed concept is processed and linked to individual goals (for theories explaining processes behind goal priming, see Bargh, 1990; 1997; Bargh & Chartrand, 1999; Kruglanski, 1996; Kruglanski et al., 2002). As a result, accessibility of goal-related constructs (e.g. knowledge, behavioural strategies) increases and serves the primed goal pursuit. Different from semantic priming effects, goal priming effects are not likely to lose power unless the primed goal is achieved, and may even get stronger in time (Förster et al., 2007; Förster,

Liberman, & Higgins, 2005; Liberman & Förster, 2008). For example, participants demonstrated an increased accessibility of goal-related words, even when the time interval between the prime and the accessibility measure was increased to 15 minutes (Goschke & Kuhl, 1993). Similarly, increased accessibility of goal-related constructs remained as long as the goal was not fulfilled (Förster et al., 2005). In another study, reading about somebody seeking casual sex made male participants more helpful towards a female experimenter, which, as the authors argued, served the goal to attain sex. The observed effect did not disappear after a delay of five minutes, which was taken as evidence of goal priming (Aarts, Gollwitzer, & Hassin, 2004). Next, participants behaved more creatively after being primed with Apple logo versus IBM logo, and the effects remained strong despite a delay between the priming task and the creativity task (Fitzimons, Chartrand, & Fitzimons, 2008). Finally, priming prestige- versus thrift-related concepts led to choosing more expensive rather than cheap consumer goods, with the effect getting stronger as the delay between the prime and the choice task increased (Chartrand, Huber, Shiv, & Tanner, 2008; for reviews of other studies on goal priming, see Custers & Aarts, 2010; Moskowitz & Gesundheit, 2009).

So, semantic and goal priming effects differ with regard to their persistence in time, and therefore we employed a delay manipulation in the current research in order to test the hypothesis on parallel priming.

2.1.2. Can semantic and goal priming effects occur after the same prime and in the same sample?

The initial and, to our best knowledge, the only direct evidence of semantic and goal priming effects occurring after the same prime was provided by Bargh and colleagues (2001). After an achievement (versus neutral) prime, the authors provided one group of

participants with an impression formation task, whereas they provided another group of participants with a behavioural task. The impression formation task sought to measure semantic priming effects (cf. Higgins et al., 1977; Srull & Wyer, 1979). In line with their expectations, Bargh and colleagues found that priming achievement resulted in judging another person as more achieving. This effect faded, which indicates semantic priming. The behavioural task was used to establish goal priming effects. As expected, participants exposed to the achievement prime performed better in a word search task, and this effect got stronger in time, indicating goal priming. These results are in line with reasoning on parallel priming. However, semantic and goal priming effects were studied across two separate groups rather than in the same sample in this study, and hence the direct test of parallel priming has yet not been performed.

Based on the study by Bargh and colleagues (2001), as well as on numerous findings of semantic and goal priming effects issuing from similar primes across different studies, it has been assumed that one prime can produce both kinds of effects: "it has been shown that the identical priming event can have a variety of qualitatively different effects" (Bargh, 2006, p.148; see also Fitzimons et al., 2008). Various scholars tried to unravel semantic and goal priming effects. For example, Kruglanski and colleagues (2002) primed participants with goals that they were either pursuing at that moment or not. Means to achieve the primed goals were provided as targets in a lexical decision task. Accessibility of goal-corresponding means increased only after priming the goals that participants were pursuing at that moment but not after priming the goals that participants were not pursuing at that moment. The authors concluded that their findings demonstrated the presence of goal priming effects and the absence of semantic priming effects, as the latter, if activated, should not depend on the currently pursued versus currently not pursued goals. Fishbach, Friedman, and Kruglanski (2003) showed that priming temptations increased accessibility

of constructs related to self-regulation, and argued that this was evidence of goal priming effects rather than semantic priming effects. To support their argument, Fishbach and colleagues demonstrated that the priming effects spread only one-way, that is, from temptations to goals, but not from goals to temptations, which would be expected in case of semantic priming. Further, according to the activation striving model (Sela & Shiv, 2009), only semantic priming effects are elicited when the primed content is perceived as consistent with the active self-concept, whereas only goal priming effects are elicited when the primed content is perceived as discrepant from the active self-concept. The authors made a special effort to stress that only one or the other kind of effects could be primed (Sela & Shiv, 2009).

Owing to the above studies, valuable insights into intricate differences between semantic and goal priming have been achieved. At the same time it is intriguing that, although given the notion that semantic and goal priming effects may occur after the same prime, the two kinds of effects have typically been studied separately (i.e. under different priming conditions). This leaves the question of whether semantic and goal priming effects can actually occur after the same prime and in the same person open. For example, we do not know whether goal priming effects would have occurred if measured after observing semantic priming effects (e.g. Sela & Shiv, 2009), or whether semantic priming effects would have been found if the right conditions had been created to observe them before measuring goal priming effects (e.g. Kruglanski et al., 2002; Fishbach et al., 2003; see also Fitzimons et al., 2008). Even the study by Bargh and colleagues (2001) does not provide a definite answer, as semantic and goal priming effects were studied across two separate participant groups. Would the same group of participants who had shown semantic priming effects have also demonstrated goal priming effects if these effects had been explicitly sought for? Our experiments are designed to find out. Additionally, we propose that

parallel priming effects may remain undetected unless the right conditions are provided, as we explain below.

2.1.3. Disclosing parallel priming: Applicability of goal pursuit

After priming heterosexual male participants with a sex prime, Aarts and colleagues (2004) observed increased helping behaviour towards a female experimenter, but not towards a male experimenter. The findings suggest that goal priming effects may fail to show up unless the given situation is suitable for the primed goal pursuit (i.e. only helping a female and not a male experimenter could get participants closer to the primed goal to seek casual sex; Aarts et al., 2004; see also Cesario et al., 2010). As semantic priming effects were not explicitly measured in this experiment, we can only speculate about them. Would participants, if asked, have rated the experimenter higher on sex-seeking? And would the experimenter's gender have made a difference in that case? In studies on semantic priming, participants tend to apply the primed concept in their target evaluations, provided that there is a sufficient semantic overlap between the prime and the target (Förster & Liberman, 2007; Higgins, 1996; Higgins & Brendl, 1995; Higgins et al., 1977). For example, when primed with "conceited", participants were most likely to make prime-related judgments of someone who was ambiguous as whether or not being conceited, when compared to someone who could only be vaguely described as conceited and, especially, when compared to someone who could be best described as self-confident rather than conceited (Higgins & Brendl, 1995). Given that such a semantic match between the prime and the target is a key pre-condition for semantic priming effects to show up, one could expect that after the sex prime, participants would rate both the female and the male experimenter higher on sex-seeking, as long as experimenter's behaviour was in any way ambiguous with regard to sex-seeking. Most importantly, irrespective of semantic priming effects, goal priming effects would only show up in the female experimenter condition, because

only that is instrumental to the primed goal pursuit, as indeed demonstrated by Aarts and colleagues (2004). This could have important implications for studying parallel priming effects. In some cases, applicability of goal priming effects might require different conditions than applicability of semantic priming effects, which might lead to a particular prime producing only semantic and not goal priming effects. In order to disclose parallel priming, the right conditions are needed to establish both kinds of effects. That is, for semantic priming effects to occur, the primed concept should be applicable to the target of evaluation, whereas for goal priming effects to occur, the given situation should be suitable for the primed goal pursuit.

2.1.4. The current research

The current research is, to our knowledge, the first attempt to study semantic and goal priming effects within the same experimental design and within the same sample. We primed participants with concepts related to pleasure (Study 1) and with concepts related to excellent performance (Study 2). After each prime (experimental versus neutral), we expected to observe both semantic and goal priming effects, which would indicate parallel priming. We first provided participants with an impression formation task to detect semantic priming effects. We expected the experimental (versus neutral) prime to result in rating another person more in the direction of the prime. Second, we gave participants a behavioural task to measure goal priming effects. We expected the experimental (versus neutral) prime to make participants act toward primed goal pursuit, provided that goal pursuit is applicable in a given situation.

We hypothesized that semantic priming effects on impression formation and goal priming effects on behaviour would differ with regard to their persistence in time. That is, semantic priming effects would occur before a delay and decay after the delay, whereas

goal priming effects would show no decay after the delay. Next, we assumed that goal priming effects may fail to show up and hence prevent parallel priming effects from being detected, unless a situation that is suitable for the primed goal pursuit is provided. We tested this assumption in Study 2, where we strengthened the applicability of the primed excellence goal by putting participants in a competitive (versus non-competitive) situation. We hypothesized that, after the excellence prime, goal priming effects would be more likely to show up in a competitive than in a non-competitive situation. We expected semantic priming effects to be driven by a mere semantic match between the prime and the target in the impression formation task, and hence show up irrespective of the goal applicability manipulation.

Because the exact scales we used to measure semantic and goal priming effects were not established scales but were designed specifically for this research, we first looked in both studies how separate scale items responded to the priming manipulation. This helped us decide whether the selected items could capture the priming effects and should therefore be included in the overall scales measuring these effects.

2.2. Study 1

In Study 1, participants were primed with a hedonic prime, which we conceptualized as looking for pleasure, seeking satisfaction and enjoyment, avoiding effort, and acting on the spur of the moment. We expected the same hedonic prime, when compared to the neutral prime, to result (a) in rating another person higher on hedonic characteristics before but not after a delay, thus demonstrating semantic priming effects, because rating another person more or less in the direction of the prime was not particularly instrumental to the primed goal pursuit; and (b) in making more hedonic behavioural choices before and after a delay, thus demonstrating goal priming effects.

2.2.1. Method

Participants and design

The study involved Web-based data collection, and was carried out in the Amazon's Mechanical Turk (MTurk) website with an American sample. Previous findings have shown that the data obtained via MTurk were at least as reliable as those obtained via traditional methods (see Buhrmester, Kwang, & Gosling, 2011). Respondents received small financial tokens for participating. In total, 205 participants completed the study. We excluded 30 bogus responses (e.g. writing random words in unscrambling sentences task) and five responses that were completed in a very short (< 5min) or long (≥ 112.95 min; most responses were completed within one hour) time. This resulted in the final sample size of 170 participants. The study had a 2 (hedonic versus neutral prime) x 2 (delay versus no delay) between-subjects design.

Materials and procedure

Participants completed a set of tasks in an online survey. These included the priming manipulation, the delay manipulation, a measure to establish semantic priming effects, and a measure to establish goal priming effects. After completing all tasks, participants were debriefed.

Priming manipulation. Subjects had to unscramble 18 five-word sentences and write down one word in each sentence that does not belong in a grammatically correct sentence (cf. Srull & Wyer, 1979). In the hedonic prime condition, half of the words to be written down were hedonic-related (e.g. *desire*, *comfort*, *weekend*, and *tasty*) and the other half were neutral words (e.g. *follow*, *walked*, *birds*, and *tables*). In the neutral prime condition, all words to be written down were neutral words (e.g. *shoe*, *mouse*, *saying*, and *plastic*).

Delay manipulation. A furniture rating task was either provided before the priming manipulation (no delay) or after the priming manipulation (delay). The delay manipulation was selected carefully to avoid having participants pursue the primed hedonic goal when completing the furniture rating task. Participants saw nine pieces of furniture and were asked to rate them (from 0 *not at all* to 3 *absolutely*) according to a set of characteristics (i.e. originality, practicality).

Semantic priming effects. We employed an impression formation task to measure semantic priming effects (cf. Higgins et al., 1977)[a]. Participants read a description of a target person (i.e. a student) and next rated that person according to a set of characteristics. The description of the target was made ambiguous with regard to the prime-related characteristics (cf. Bargh et al., 2001; Higgins et al., 1977). Dependent on the prime, the target could be seen as either a hedonic or a neutral person (e.g. his grades are average; he tries to make sure that he passes exams, even though he doesn't study as thoroughly as some of his class mates; and other students think that he is fun and friendly). Participants rated (from 0 *not at all* to 5 *very much*) to what extent certain characteristics apply to the target person, among which there were eight hedonic-related characteristics: laid-back, naïve, efficient (reversed scores), enjoying life, spontaneous, competent (reversed scores), easygoing, and careless, and one was a prime-irrelevant characteristic, namely helpful. A descriptive analysis revealed that all the hedonic-related characteristics could capture semantic priming effects. Specifically, in the no delay condition, all the characteristics showed a tendency for the ratings to increase after the hedonic (versus neutral) prime[b]. We

[a] For explorative reasons, we included another experimental condition, which had a slightly different impression formation task and could be interpreted as prime-inhibiting or alternate-priming. We asked participants to imagine having to work together with the person in the impression formation task. This could have primed working hard rather than seeking pleasure. Our current hypotheses did not specify the effects (goal or semantic) of this manipulation and we did not include this condition in the current analyses.

[b] Descriptive statistics for each characteristic are available from the first author upon request.

averaged the ratings for these characteristics to form a composite scale of hedonic ratings ($\alpha = .70$), with higher scores meaning higher hedonic ratings.

Goal priming effects. To measure goal priming effects, participants were provided with behavioural scenarios where they could choose between a hedonic and non-hedonic behavioural alternative[c]. The scenarios included (here the hedonic alternative is listed first): having chocolate versus fruit for a snack, spending inherited money on life's pleasures versus investing the money, drinking more tasty juice versus more environmentally-friendly juice, having pizza versus salad for lunch, choosing a certificate for a dinner at a restaurant versus a certificate for groceries as a lottery prize, reading "Entertainment Weekly" versus "The New York Review of Books", and watching an entertaining action film versus an educational documentary (cf. Feather, 1995; O'Curry & Strahilevitz, 2001)[d]. A descriptive analysis revealed that all these scenarios could capture goal priming effects, except for when participants had to choose to have pizza or salad for lunch. Specifically, in both delay conditions, we observed a tendency for the share of hedonic choices, relative to non-hedonic choices, to increase after the hedonic (versus neutral) prime[e]. For the pizza versus salad scenario, however, the share of hedonic choices

[c] For explorative reasons, we included three other scenarios, which could be interpreted as inhibiting the pursuit of hedonic goals or priming alternate goals. These scenarios implied that participants would take up certain responsibilities, namely choosing from two companies for a job, two committees in an organization to become a member of, and two functions in a board of a leisure activity club to fulfil. Our current hypotheses did not specify the effects of hedonic prime on choice in these scenarios and we did not include them in the current analysis.

[d] Two other scenarios were intended to differentiate between a hedonic and non-hedonic choice alternative: 1) "*Suppose you were planning to go for some exercise outside. However, as the evening approaches, it starts getting pretty cold. What do you think you would decide to do?*: *Dress up warm and yet go exercising* (non-hedonic) versus *stay warm at home and plan to go exercising some other day* (hedonic)"; 2) "*Imagine it is getting cold in your house and you want to turn on the heater. You also know that turning on the heater requires energy, which causes environmental problems. What would be more important for you in this situation?*: *My comfort at home is of primary importance, even if it increases my energy use* (hedonic) versus *saving energy is very important, even if it makes me feel a bit less comfortable at home* (non-hedonic)". However, both scenarios implied that participants had non-hedonic considerations (i.e. planning to go exercising, being aware of the environmental impact of energy use), which could confound the effects of the hedonic prime. We realized this after the data was collected and excluded the confounded scenarios from the analyses (these scenarios were provided as the last ones in the list).

[e] Descriptive statistics for each scenario are available from the first author upon request.

increased after the hedonic (versus neutral) prime only in the delay condition, whereas it somewhat decreased in the no delay condition (choices in this scenario did not differ significantly across the four delay by prime conditions; $X^2(3) = 1.57$, *ns*). This scenario was also the only one where already in the neutral prime condition the hedonic choice alternative was preferred in about 60% of the cases. This could have created a ceiling effect for the hedonic prime. We decided to exclude this scenario from the overall measure of hedonic behavioural choice; our dependent variable thus was the total number of hedonic choices across the remaining six scenarios. We discuss the results that occur if all scenarios are included as well.

2.2.2. Results and discussion

Semantic priming effects. We only expected semantic priming effects on ratings on prime-relevant characteristics, as any differences across conditions should be due to the increased accessibility of the primed semantic category rather than to other processes (e.g. changes in affect which may bias the overall ratings of another person). A 2 (prime) x 2 (delay) between-subjects ANOVA was conducted on the ratings of the target person on hedonic characteristics, with the significance level at $p \leq .05$. Main effects of prime ($F(1, 166) = 2.36$, *ns*) and delay ($F(1, 166) < 1$) were not significant. As expected, we found a significant interaction effect ($F(1, 166) = 6.73$, $p = .010$, $\eta p^2 = .039$). Planned contrasts (see Figure 1) showed that in the no delay condition, the hedonic prime indeed resulted in rating the target person as more hedonic than the neutral prime ($M_{\text{hedonic}} = 3.47$, $SD_{\text{hedonic}} = .57$, $M_{\text{neutral}} = 3.11$, $SD_{\text{neutral}} = .58$, $t(166) = 2.85$, $p = .005$, $d = .63$). As predicted, the effects vanished after the delay, resulting in no significant difference between hedonic ratings in the hedonic prime and the neutral prime conditions ($M_{\text{hedonic}} = 3.22$, $SD_{\text{hedonic}} = .57$, $M_{\text{neutral}} = 3.32$, $SD_{\text{neutral}} = .59$, $t(166) = -.768$, *ns*).

The 2 (prime) x 2 (delay) between-subjects ANOVA showed no significant main or interaction effects on the ratings on the hedonic-irrelevant characteristic, i.e. helpful (all *p*s > .05).

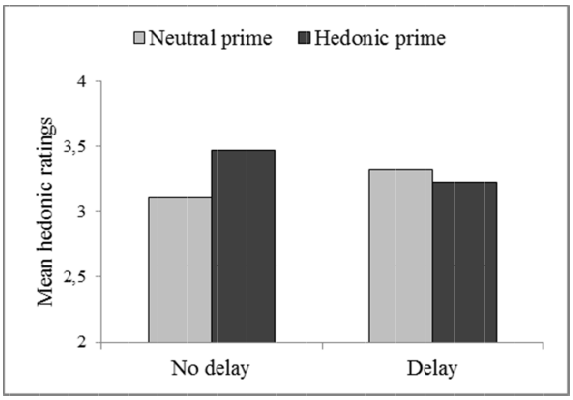

Figure 1. Semantic priming effects. Ratings of the target person on hedonic characteristics as a function of the prime and delay.

Goal priming effects. Hedonic behavioural choice was analysed by a 2 (prime) x 2 (delay) between-subjects ANOVA, with the significance level at $p \leq .05$. We found a significant main effect of prime ($F(1, 166) = 9.95$, $p = .002$, $\eta p^2 = .057$). As predicted, after the hedonic prime, participants made more hedonic choices ($M = 2.92$, 95% CI [2.64; 3.19]) than after the neutral prime ($M = 2.29$, 95% CI [2.00; 2.57]). The main effect of delay and the interaction effect were not significant (Fs < 1). Planned contrasts (see Figure 2) revealed that the hedonic prime resulted in participants making more hedonic choices than the neutral prime in the no delay condition ($M_{hedonic} = 2.85$, $SD_{hedonic} = 1.22$, $M_{neutral} = 2.20$, $SD_{neutral} = 1.44$, $t(166) = 2.26$, $p = .025$, $d = .49$), as well as in the delay condition ($M_{hedonic} =$

2.98, $SD_{hedonic} = 1.18$, $M_{neutral} = 2.37$, $SD_{neutral} = 1.36$, $t(166) = 2.20$, $p = .029$, $d = .48$), confirming our hypothesis on goal priming effects being longer-lasting.

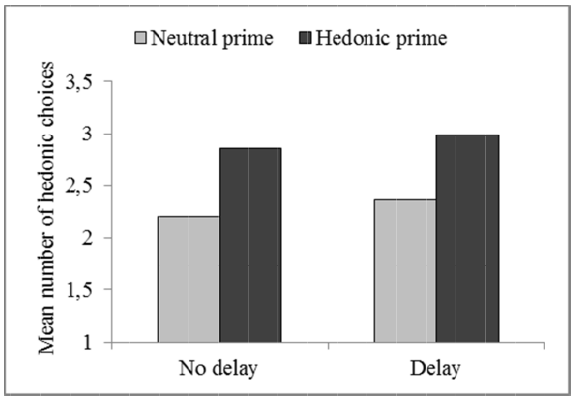

Figure 2. Goal priming effects. Number of hedonic choices made as a function of the prime and delay.

We also tested goal priming effects when the scenario of having pizza or salad for lunch is included in the overall measure of behavioural choice. The results followed the same patterns, although the expected priming effects in the no delay condition were only marginally significant ($p < 1$); the expected priming effects in the delay condition were significant ($p < .05$)[f].

The results in Study 1 support our hypothesis on parallel priming, as we found semantic priming effects and goal priming effects after the same prime and within the same sample. The hedonic prime resulted in rating the target person as more hedonic than the neutral prime, but only before the delay, which indicates semantic priming. The same

[f] A detailed analysis of results that occur if all scenarios are included is available from the first author upon request.

hedonic prime made participants choose more hedonic behavioural alternatives than the neutral prime, and this effect persisted after the delay, indicating goal priming.

Different from other behavioural scenarios, the scenario of having pizza versus salad for lunch did not show an increase in hedonic choices after the hedonic prime in the no delay condition. A ceiling effect could have occurred here, since the majority of participants preferred pizza over salad even without the hedonic prime. However, this proposition is speculative and needs further testing. Including this scenario in the analysis yielded the same conclusions for our hypotheses as when it was excluded. Yet, future studies are needed to test whether our results can be replicated on the selected behavioural choice scenarios, as well as on other scenarios that include a choice between a hedonic and non-hedonic alternative.

To test the robustness of parallel priming effects, we designed Study 2 where we primed participants with an excellence prime. Additionally, we manipulated goal applicability in Study 2 to test our assumption that goal priming effects are more likely to show up in a situation that is more (versus less) suitable for goal pursuit.

2.3. Study 2

The excellence-related concepts we used were conceptualized as related to achievement, good performance, competence, and efficiency. To make the primed goal more applicable, we put participants in a competitive situation, and compared this to a non-competitive situation. We expected the excellence (versus neutral) prime to result in more excellent behaviour and we expected these effects to be more pronounced in the competitive situation than in the non-competitive situation. Importantly, we aimed for a semantic overlap between the prime and the target in the impression formation task across both the

competitive and the non-competitive situations, and hence expected semantic priming effects to show up irrespective of the goal applicability manipulation.

2.3.1. Method

Participants and design

Students (N = 104) of the international Psychology Bachelor program at a Dutch University participated as a course requirement. Participants were randomly assigned to the conditions of a 2 (excellence versus neutral prime) x 2 (delay versus no delay) x 2 (competitive versus non-competitive situation) between-subjects design.

Materials and procedure

Participants were taken to individual cubicles where they found written instructions of how to complete the experiment and a set of ostensibly unrelated tasks. Participants completed a set of tasks, including the priming manipulation, the delay manipulation, a measure to establish semantic priming effects, and a measure to establish goal priming effects. The goal applicability manipulation was embedded in the instructions for the impression formation task. After completing all tasks, participants filled in a questionnaire for a suspicion check, adapted from Bargh et al. (2001). No participant could report the exact relationship between the priming task and the other experimental tasks. Finally, participants were debriefed.

Priming manipulation. Participants were asked to solve a word-search puzzle (cf. Bargh et al., 2001). A 10 x 10 letter matrix was presented with a list of 13 words to be found in the matrix. Words could appear reading either from left to right, from right to left, reading down, or reading up, either in a straight line or diagonally. In the excellence prime condition, seven words to be found were excellence-related (e.g. *achieve*, *strive*, *master*,

and *succeed*) and the other words were neutral (e.g. *staple*, *plant*, *green*, and *building*). In the neutral prime condition, all words to be found were neutral words (e.g. *hat*, *river*, *carpet*, and *window*).

Delay manipulation. We used the same manipulation of delay as in Study 1.

Goal applicability manipulation. Instructions for the impression formation task differed across the two conditions of goal applicability. To create a situation suitable for goal pursuit, a competitive relationship between the participants and the target person of the impression formation task was established. Participants learnt that later in the experiment they would complete a word-search task and receive points for it. They were told that the target person (i.e. another student) had also received points for completing a (different) task in the experiment before, and that his score would be subtracted from their score to calculate their final score. The instructions made clear that participants would be better off if they performed better in their task, and if the target person had performed worse in his task. Participants in the non-competitive situation only received general instructions for completing the impression formation task and learnt that they would engage in a word-search task later in the experiment. No other information was provided to them[g].

Semantic priming effects. Like in Study 1, participants completed an impression formation task. Participants were informed that they were about to read an interview with the target person (i.e. another student) completed at the end of a previous experiment. In order to achieve a semantic overlap between the prime and the target, the target description was made ambiguous with regard to the prime-related characteristics. Dependent on the prime,

[g] For explorative reasons, we included another experimental condition, which could be interpreted as prime-inhibiting or alternate-priming. We informed participants that their score in the subsequent task will be combined for evaluation with the score of the person in the impression formation task. This could have primed free-riding rather than performing excellently. Our current hypotheses did not specify the effects (goal or semantic) of this manipulation and we did not include this condition in the current analyses.

the information about the target person could be interpreted as evidence of excellence or as neutral (e.g. he studied for an exam until the last minute; he failed an exam recently because of helping his friend but he thinks he can prepare for a re-sit and pass it; and he considers subscribing to an intensive tennis course which might interfere with his studies but he thinks it will be all right). Participants rated the target person according to a set of characteristics, each offered as a continuum with two opposite traits. Short descriptions were provided for each trait. Five pairs of traits represented no excellence versus excellence: naïve – wise, lazy – hard-working, inefficient – efficient, incompetent – competent, and unambitious – ambitious. Three pairs of traits were prime-irrelevant: mean – kind, rude – friendly, and dishonest – honest. Participants rated the target person on a continuum from one trait to another on an 11-point scale, for example, from naïve (5) to 0 to (5) wise. We recoded the ratings on a scale from 1 to 11, with higher scores meaning higher excellence ratings. An initial descriptive analysis revealed that all the excellence-related characteristics could capture semantic priming effects, except for lazy – hard-working. Specifically, in the no delay condition, we observed a tendency for the ratings to increase after the excellence (versus neutral) prime, irrespective of the goal applicability manipulation[h]. For lazy – hard-working, however, the ratings increased after the excellence (versus neutral) prime (without a delay) only in the competitive situation, whereas the ratings somewhat decreased in the non-competitive situation (the experimental manipulations did not have significant main or interaction effects on these ratings; all *p*s > .05). It is unclear why lazy – hard-working yielded somewhat different responses to the excellence prime than other excellence-related characteristics. One possibility is that lazy – hard-working is not unambiguously related to excellence. You can be lazy and very clever, but in competitive situations you need to work hard to be excellent. However, the

[h] Descriptive statistics for each characteristic are available from the first author upon request.

reliability of the excellence scale did not change much depending on whether lazy – hard-working was included (α = .66) or excluded (α = .62) from the scale, which leaves the question whether participants perceived this characteristic as somehow different from others open. For now, we excluded this characteristic from the overall scale measuring excellence ratings. We averaged the ratings for the remaining four excellence-related characteristics to form a composite scale of excellence ratings. We discussed the results that occurred when including lazy – hard-working in the scale as well.

Goal priming effects. Three word-search puzzles were designed to measure excellent performance (cf. Bargh et al., 2001). Unlike the word-search task in the priming manipulation, participants did not receive a list of words embedded in the puzzles. They were told that there were 10 words hidden in each puzzle representing members of a certain category (i.e. food, body parts, and colours), with the category name written on the top of each puzzle. Participants could switch between the three puzzles. The dependent variable was the total number of words found in the three puzzles in 10 minutes. An initial descriptive analysis revealed that this measure could capture goal priming effects. Specifically, we observed a tendency of more words being found after the excellence (versus neutral) prime in all experimental conditions.

2.3.2. Results and discussion

Semantic priming effects. As in Study 1, we only expected priming effects on prime-relevant characteristics. A 2 (prime) x 2 (delay) x 2 (goal applicability) between-subjects ANOVA was conducted on the excellence ratings, with the significance level at $p \leq .05$. The main effects of prime ($F(1, 96) = 2.54$, *ns*), delay ($F(1, 96) = 1.03$, *ns*) and goal applicability ($F(1, 96) = 2.28$, *ns*) were not significant. The prime by goal applicability interaction, the delay by goal applicability interaction, and the three-way interaction were

not significant (all *F*s <1), confirming that the goal applicability manipulation did not influence semantic priming effects. As expected, we found a significant prime by delay interaction ($F(1, 96) = 8.21$, $p = .005$, $\eta p^2 = .079$). Figure 3 illustrates priming effects on excellence ratings before and after the delay (for the non-competitive and competitive situations combined, since goal applicability manipulation did not affect the ratings). Planned contrasts revealed that in the no delay condition, participants exposed to the excellence prime rated the target person higher on excellence than participants exposed to the neutral prime, irrespective of the goal applicability manipulation (control situation: $M_{excellence} = 5.95$, $SD_{excellence =} 1.07$, $M_{neutral} = 4.70$, $SD_{neutral} = 1.07$, $t(96) = 2.13$, $p = .036$, $d = 1.168$; competitive situation: $M_{excellence} = 5.70$, $SD_{excellence =} 1.34$, $M_{neutral} = 4.63$, $SD_{neutral} = 1.35$, $t(96) = 2.33$, $p = .022$, $d = .796$). In line with our prediction, the priming effect vanished after the delay, resulting in no significant difference in excellence ratings across the priming conditions, again irrespective of the goal applicability manipulation (control situation: $M_{excellence} = 5.56$, $SD_{excellence} = 1.20$, $M_{neutral} = 6.08$, $SD_{neutral} = 1.55$, $t(96) = -.97$, *ns*; competitive situation: $M_{excellence} = 5.13$, $SD_{excellence} = 1.33$, $M_{neutral} = 5.27$, $SD_{neutral} = 1.37$, $t(96) = -.29$, *ns*).

We did not find any significant effects of prime, delay, and goal applicability, or interaction effects, on the ratings on excellence-irrelevant characteristics (all *p*s > .05).

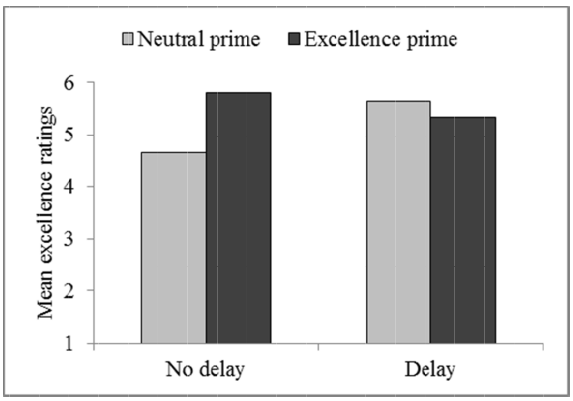

Figure 3. Semantic priming effects. Ratings of the target person on excellence characteristics as a function of the prime and delay (the two goal applicability conditions combined).

Including lazy – hard-working in the scale of excellence ratings yielded the same conclusions for our hypotheses as when it was excluded, except that the differences in excellence ratings in the non-competitive situation before the delay did not reach significance (but were in the expected direction; $p > .1$). The expected semantic priming effect in the competitive situation before the delay was significant ($p < .05$). There was no significant interaction between goal applicability, on the one hand, and prime and delay, on the other hand, which suggests that semantic priming effects were not susceptible to goal applicability (all Fs < 1). As expected, no effects of the hedonic prime on target evaluations remained after the delay (all t's < 1) [i].

Goal priming effects. The number of words found in the word-search task was analysed by a 2 (prime) x 2 (delay) x 2 (goal applicability) between-subjects ANOVA, with the significance level at $p \leq .05$. The prime had a main effect ($F(1, 96) = 5.44$, $p = .022$, $\eta p^2 =$

[i] A detailed analysis of results that occur if all characteristics are included is available from the first author upon request.

.054) on performance, with participants exposed to the excellence prime finding more words (M = 13.73, 95% CI [12.81; 14.66]) than participants exposed to the neutral prime (M = 12.19, CI [11.26; 13.12]). Main effects of delay and goal applicability were not significant (Fs < 1). The prime by delay interaction, the delay by goal applicability interaction, and the three-way interaction were not significant (Fs < 1). In line with our prediction, we found a marginally significant prime by goal applicability interaction (F(1, 96) = 3.07, p = .083, ηp^2 = .031). Planned contrasts showed that priming had a significant effect on performance only in the competitive situation, and not in the non-competitive situation. Figure 4 illustrates priming effects on performance in the competitive situation, before and after the delay. As expected, when the situation suitable for the primed goal pursuit was provided, the excellence prime resulted in more words found than the neutral prime, both before (a marginally significant effect) and after the delay (no delay: $M_{\text{excellence}}$ = 14.63, $SD_{\text{excellence}}$ = 3.24, M_{neutral} = 12.44, SD_{neutral} = 3.50, t(96) = 1.86, p = .065, d = .649; delay: $M_{\text{excellence}}$ = 14.36, $SD_{\text{excellence}}$ = 3.75, M_{neutral} = 11.14, SD_{neutral} = 3.82, t(96) = 2.56, p = .012, d = .851). In the non-competitive situation, differences in performance after the excellence and neutral prime followed a similar trend but did not reach significance (no delay: $M_{\text{excellence}}$ = 12.70, $SD_{\text{excellence}}$ = 2.50, M_{neutral} = 12.60, SD_{neutral} = 3.92, t(96) = .07, *ns*; delay: $M_{\text{excellence}}$ = 13.25, $SD_{\text{excellence}}$ = 2.80, M_{neutral} = 12.58, SD_{neutral} = 2.39, t(96) = .49, *ns*).

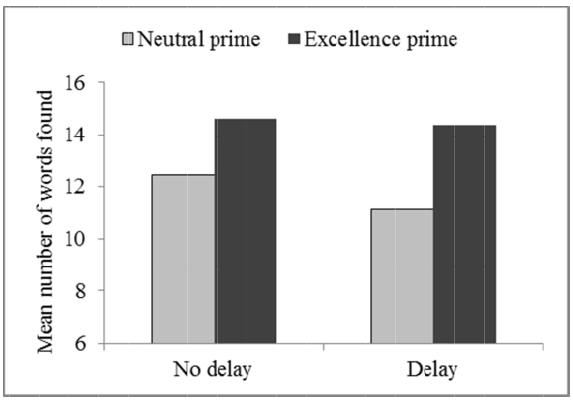

Figure 4. Goal priming effects. Number of words found in the word-search task as a function of the prime and delay, given a situation suitable for the primed goal pursuit (i.e. competitive situation).

Again, we observed parallel priming effects. After the same prime and in the same sample, we first found short-lived semantic priming effects on impression formation and next we observed longer-lasting goal priming effects on behaviour. Notably, goal priming effects failed to show up and hence prevented parallel priming effects from being disclosed when no situation suitable for the primed goal pursuit was provided. We expected semantic priming effects to be independent of the goal applicability manipulation, which was partly supported by our findings. All excellence characteristics except for lazy – hard-working showed increased ratings after the excellence prime when compared to the control prime, irrespective of goal applicability. Including lazy – hard-working in the overall excellence scale resulted in non-significant semantic priming effects in the non-competitive condition. Possibly, hard-working is only considered necessary for excellent performance in competitive situations, which would explain why this characteristic did not demonstrate semantic priming effects unless competition was induced. This explanation, however, is

speculative and needs further testing. Importantly, despite whether or not lazy – hard-working was included in the analysis, there was no significant interaction effect between goal applicability, on the one hand, and prime and delay, on the other hand. These results suggest that semantic priming effects were not susceptible to goal applicability. Yet, future studies are needed to test whether our findings can be replicated on the selected excellence characteristics as well as on other characteristics that reflect excellent performance across competitive and non-competitive situations.

Study 2 provided further support for parallel priming effects. In addition, the results of Study 2 suggest that parallel priming effects may require certain conditions in order to be disclosed. Specifically, unless a situation suitable for the primed goal pursuit is provided, goal priming effects may remain undetected, thus disguising parallel priming effects.

2.4. General Discussion

Across two studies, we found consistent parallel priming effects: semantic priming effects and goal priming effects occurred after the same prime and within the same sample. Semantic priming effects only lasted for a short time and vanished after a delay, whereas goal priming effects lasted longer (cf. Bargh et al., 2001; Förster et al., 2007). In addition, we observed in Study 2 that, without a situation suitable for goal pursuit, goal priming effects failed to show up, thus preventing parallel priming effects from being revealed. The results suggest that the same prime might trigger diverse priming effects due to parallel priming, and that specific experimental conditions may be necessary for these effects to be disclosed.

Our results do not rule out the possibility that a prime could elicit just one kind of effect (cf. Fishbach et al., 2003; Kruglanski et al., 2002; Sela & Shiv, 2009). However, we

showed that parallel priming is possible and that the right conditions should be created to disclose it. Short-lived semantic priming effects may "hide" behind the observed goal priming effects and thus may be overlooked. To capture semantic priming effects, one should either choose tasks that are irrelevant to primed goal pursuit or that would yield different responses depending on whether semantic or goal priming effects are in action. To reveal goal priming effects, one may need to introduce a situation suitable for goal pursuit and to give enough time for the effects to show up. To sum up, our studies show that one kind of effect cannot be denied based on merely observing the other kind of effect. In terms of parallel priming, both effects are presumably triggered by a prime until ruled out by a thorough experimental design.

Although we employed an impression formation task to measure semantic priming effects and a behavioural task to measure goal priming effects, we do not suggest that both kinds of effects cannot be displayed in each of these tasks. For example, in a study by Moskowitz, Gollwitzer, Wasel, and Schaal (1999), participants were more likely to make stereotypical judgments of another person after a stereotype prime, which illustrates classical semantic priming effects on impression formation. Interestingly, however, participants who endorsed chronic egalitarian goals refrained from making stereotypical judgments, even after the stereotype prime (Moskowitz et al., 1999). The study provides a clear example of performance in an impression formation task being goal-driven (for similar results, see Moskowitz, Salomon, & Taylor, 2000). In the current studies, we formulated impression formation tasks in such a way that rating another person more or less in the direction of the prime was not particularly instrumental to the primed goal pursuit. By doing so, we could disentangle the two kinds of effects and demonstrate purely semantic priming effects on impression formation. However, in case rating another person

either more or less in the direction of the prime did serve an active goal, we would indeed expect priming effects on impression formation to be goal-driven.

We selected multiple items for the impression formation task and the behavioural choice task that could potentially capture semantic and goal priming effects of the hedonic prime (Study 1) and excellence prime (Study 2). Since these were not established measurement scales, we applied descriptive analyses to estimate whether each item was capable of capturing the expected priming effects. This led to excluding one behavioural choice item (Study 1) and one impression formation item (Study 2) that yielded different responses to the priming manipulations when compared to other items in the corresponding scales. Yet, including these items in the analyses did not change the main conclusions for our hypotheses. However, the question remains why priming effects were inconsistent for these specific items. We suggested potential explanations that need to be tested in future studies. More generally, our results on parallel priming effects need to be replicated in future studies to test the generalizability of the results. Parallel priming effects need to be tested in different conditions (e.g., supporting or not supporting the primed goal pursuit), including different dependent variables and different priming manipulations.

Given parallel priming, an elderly prime could theoretically trigger slow walking behaviour at first and afterwards result in increased walking speed. If thoroughly measured, parallel priming effects may turn out to be more common than generally assumed. Overall, we demonstrated that semantic and goal priming are different but not necessarily mutually exclusive processes. We introduced the possibility of parallel priming and we hope that our results will assist and inspire future attempts to study the intricate mechanisms behind this phenomenon.

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Chapter 3

RIDING THE ECOLOGICAL WAVE: WHAT MAKES PRO-ENVIRONMENTAL PRODUCTS ATTRACTIVE? A GOAL-BASED APPROACH TO PRODUCT EVALUATIONS[a]

[a] This chapter is based on the manuscript submitted for publication: "Riding the ecological wave: What makes pro-environmental products attractive? A goal- and value-based approach to product evaluations" by Goda Perlaviciute, Linda Steg, and Siegwart Lindenberg.

Abstract

We integrate goal theory and value theory for a conceptual framework that explains evaluations of pro-environmental food products. We propose and test the hypothesis that information on pro-environmental product attributes strengthens pro-environmental goals among consumers with strong biospheric values. These consumers are predicted to judge the product with regard to how well it enables them to attain pro-environmental goals. It is also predicted that the goal-based valence of the product will colour consumers' evaluations of various other product characteristics (creating a halo effect). Since pro-environmental goals are by nature normative, we predict and find that virtue products, which fulfil normative goals (e.g. good health), are seen as more suitable for attaining pro-environmental goals than vice products, which fulfil hedonic goals (e.g. indulgence). We also find the expected interaction effect of biospheric values and product type on evaluations of pro-environmental products, and the halo effect. Indeed, stronger biospheric values resulted in more positive evaluations of various characteristics (e.g. tasty, healthy) of virtue products but not of vice products, although both products had pro-environmental attributes. We discuss the theoretical and practical implications of the goal-based approach for product evaluations.

Keywords: goals; halo effect, pro-environmental products; values; vice; virtue.

3.1. Introduction

Adding information to products about certain attributes that other competing products may not have is a popular marketing strategy, especially in the food domain. Such information may include nutrition and health claims (Lähteenmäki, 2013; Williams, 2005), production methods (e.g. free of genetically modified organisms; Loureiro & Hine, 2004), positive societal and environmental impact (e.g. fair-trade, pro-environmental; De Pelsmacker & Janssens, 2007; Thøgersen, Jørgensen, & Sandager, 2012), and other qualities (McCluskey & Loureiro, 2003). It is often assumed that information on positive attributes promotes positive evaluations of a product, provided that consumers care about these attributes (cf. Thøgersen et al., 2012; Van Osselaer et al., 2005). Empirical support for this assumption is mixed (see McCluskey & Loureiro, 2003). The effects of attribute information on product evaluation vary across attributes (e.g. consumers were willing to pay highest premium for a "fair-trade" coffee, somewhat lower premium for a shade grown coffee, and lowest premium for an organic coffee; Loureiro & Lotade, 2005) and across individuals, depending on how much they value the relevant attribute (e.g. a soy label induced negative effects on taste perception among taste-conscious consumers but not among health-conscious consumers; Wansink, Park, Sonka, & Morganosky, 2000). The central question in this paper is whether information on positive product attributes works the same for all kinds of products. Could it be that attaching such information to some products is more effective than attaching it to other products? It has been proposed, for example, that health claims are more effective in enhancing positive evaluations of products that already have a healthy image (see Lähteenmäki, 2013). Several studies indeed found a positive interaction between health claims and the considered health image of a product on product evaluations (Dean et al., 2007; Siegrist, Stampfli, & Kastenholz, 2008), although another study found a negative interaction (Bech-Larsen & Grunert, 2003). Also information on pro-

environmental product attributes was observed to work somewhat differently for different kinds of products. For example, information on pro-environmental practices enhanced preference for some tomato brands but not for others (Johansson, Haglund, Berglund, Lea, & Risvik, 1999) and resulted in different willingness-to-pay values for different types of fish (Wessells, Johnston, & Donath, 1999). In another study, an EKO label improved evaluations of a fillet of chicken more than of milk and a fillet of salmon (Hoogland, De Boer, & Boersema, 2007). However, a priori predictions about the effects of product type on evaluations were not made in these studies and the product type was not systematically varied, hence it is difficult to explain why the above differences occurred. Furthermore, it is not clear whether these differences depend on how important certain product attributes are to consumers. To address this knowledge gap, we develop a conceptual framework that explains evaluations of different types of pro-environmental products on the basis of goal theory and value theory (see Figure 1). By "pro-environmental products" we mean products that are claimed to have pro-environmental attributes. In line with goal theory, we propose that information on pro-environmental product attributes can strengthen consumers' pro-environmental goals and make them evaluate the product according to how well it facilitates the pursuit of these goals. In addition, on the basis of value theory, we argue that this is particularly likely for consumers who have strongly chronically activated pro-environmental goals, that is, who strongly endorse biospheric values. Most importantly, the current goal-based approach implies that, even if they are described as pro-environmental, different types of products may trigger different evaluations among consumers with strong biospheric values, depending on the extent to which these products are seen as facilitating pro-environmental goals. In the following parts of the introduction, we explain the reasoning behind our conceptual framework and we specify the conditions that define evaluations of different types of pro-environmental products.

3.1.1. Attribute information and goal-driven product evaluations

It has been established in literature that product evaluations are goal-driven: consumers seek products that best satisfy their goals and they evaluate products based on how well these products serve their goal pursuit (Brendl, Markman, & Messner, 2003; Chartrand, Huber, Shiv, & Tanner, 2008; Ferguson & Bargh, 2004; Fishbach, Shah, & Kruglanski, 2004; Kopetz, Kruglanski, Arens, Etkin, & Johnson, 2012; Markman, Brendl, & Kim, 2007; Nisbett & Kanouse, 1969; Seibt, Häfner, & Deutsch, 2007). If a product facilitates (i.e. enables to fulfil) one's goals, it will be evaluated positively, whereas it will not be evaluated positively if it does not facilitate one's goals (or might even be evaluated negatively; Fishbach et al., 2004). Importantly, however, product evaluations can be driven by various goals, and the question is what defines which goals become strong and guide evaluations of a particular product most. Goal-framing theory posits that three overarching goals may guide evaluations, namely a hedonic goal to preserve or improve the way one feels right now, a gain goal to secure or promote one's resources, and a normative goal to do the right thing and act in a morally appropriate way (Lindenberg & Steg 2007; 2013). "Overarching" means that there are many possible situational sub-goals that belong to one of the three overarching goals and become strong when a corresponding overarching goal dominates in a situation. For example, pro-environmental goals are more likely to be strong when the overarching normative goal is activated in a situation more strongly than the hedonic or gain goal.

Information on product attributes could potentially activate overarching goals and strengthen (or prime) their sub-goals in a situation (see Lindenberg, 2013). Indeed, exposure to brand names associated with either thrift or prestige products primed corresponding goals (Chartrand et al., 2008). In another study, exposure to Apple logos (when compared to IBM logos) primed a goal to be creative, and exposure to Disney

channel logos (when compared to E! channel logos) primed a goal to act honestly (Fitzimons, Chartrand, & Fitzimons, 2008). Accordingly, we expect that information on pro-environmental product attributes could strengthen one's pro-environmental goals in a situation. We argue, however, that besides situational cues, chronic activation of overarching goals is another important factor that defines which sub-goals become strong and guide product evaluations most. Specifically, we expect that information on (pro-environmental) product attributes will be more likely to strengthen (pro-environmental) goals if consumers already have the corresponding overarching (normative) goal chronically active to some extent. It has indeed been argued in goal literature that in order for a goal to be primed, it needs to be of some importance to people (Bargh, 2006; Bargh, Schwader, Hailey, Dyer, & Boothby, 2012; Kruglanski et al., 2002). We propose that individual values, which we conceptualise as chronically activated overarching goals, define the extent to which product information can prime associated goals (see Lindenberg & Steg, 2007; 2013; Steg, Bolderdijk, Keizer, & Perlaviciute, in press). We elaborate on this proposition below.

3.1.2. Chronic goal activation: Individual values

Values are defined as "desirable transsituational goals, varying in importance, that serve as guiding principles in the life of a person or other social entity" (Schwartz, 1992, p. 21). It has been found that people express more positive evaluations and stronger preference for choice alternatives that are more (versus less) suitable for the pursuit of their important values (Feather, 1995; Feather, Norman, & Worsley, 1998; Steg, Perlaviciute, Van der Werff, & Lurvink, in press). Next, people act more in line with certain values if exposed to value-relevant cues (e.g. value-related words, value-supporting arguments; Evans et al., 2012; Maio, 2010; Maio, Olson, Allen, & Bernard, 2001; Maio, Pakizeh, Cheung, & Rees, 2009), and particularly so if these values are important to them (Hoogland, de Boer, &

Boersema, 2005; Verplanken & Holland, 2002). But what do these findings tell us about people's goals across situations and the effects of these goals on product evaluations? Although values reflect overarching goals (see Hitlin & Piliavin, 2004), the goal dynamics is often left implicit in value theory. We conceptualize values as chronically activated overarching goals. We propose that when a certain overarching goal is strongly chronically activated (i.e. it is an important value) and when it is activated by cues in a situation, the corresponding sub-goals will become strong and guide product evaluations most.

Pro-environmental goals are more likely to be strong for consumers with strong biospheric values, who ascribe much importance to the quality of nature and the environment (De Groot & Steg, 2008; 2010; Steg & De Groot, 2012; Stern, 2000; Stern, Dietz, & Kalof, 1993). The information on pro-environmental product attributes should therefore be particularly important for these consumers. There is indeed evidence to suggest that the stronger their biospheric values[b], the more people favour pro-environmental choice alternatives, such as environmentally-friendly washing detergents (Dahlstrand & Biel, 1997), restaurants serving organic meals (Steg et al., in press), and pro-environmental food products (Hoogland et al., 2007; Thøgersen, 2011; Thøgersen & Ölander, 2002). Stronger biospheric values were also linked to more positive attitudes towards environmental actions (Grunert & Juhl, 1995) and a personal norm to protect the environment (Nordlund & Garvill, 2002), which, in turn, resulted in more (self-reported) purchase of pro-environmental products (see also Stern, 2000). Also, consumers with strong biospheric values believed that supermarkets should operate in an environmentally

[b] Some studies explored the effects of biospheric values (e.g. Dahlstrand & Biel, 1997; Steg et al., in press; Verplanken & Holland, 2002), while others included universal values, which integrate both biospheric values (i.e. valuing the environment and nature) and altruistic values (i.e. valuing well-being of other people; e.g. Hoogland et al., 2007; Thøgersen, 2011; Thøgersen & Ölander, 2002). Since biospheric and altruistic values are typically positively correlated and have similar effects on evaluations and sustainable behaviour across situations (as long as these values are not in conflict; see Steg & De Groot, 2012), we consider the results on effects of universal values as describing the effects of biospheric values; we consistently use the term biospheric when reporting the effects of biospheric as well as universal values.

sustainable manner, which seemed to encourage their environmentally responsible (self-reported) purchases (Collins, Steg, & Koning, 2007). Preference for pro-environmental products over products with other benefits was in fact strongest when respondents strongly endorsed biospheric values and when these values were activated in an experiment by value-related cues (Hoogland et al., 2005; Verplanken & Holland, 2002). We propose that the information on pro-environmental product attributes could serve as a cue that activates biospheric values and hence strengthens pro-environmental goals, provided that people strongly endorse these values.

But will stronger biospheric values necessarily lead to more positive evaluations of products that are claimed to have pro-environmental attributes? More specifically, are the effects of values merely based on product information, or could the type of a product play a role as well? Value theory is mute with regard to this question and does not yield predictions about potential differences in value effects on evaluations of different types of products. Yet, goal theory would predict that besides the information on pro-environmental attributes, the extent to which a certain product is seen as facilitating pro-environmental goals is important for product evaluations. Different types of products may be perceived differently with regard to how well they facilitate pro-environmental goals, as we explain below.

3.1.3. Value effects on evaluations of different types of products

We argued so far that product information could strengthen associated goals, if the corresponding overarching goal is strongly chronically activated to a person (i.e. if it is an important value). However, the goal-based approach implies that the mere semantics of product description (e.g. “pro-environmental”) does not yet determine goal-driven evaluations. Different types of products may be seen as more or less suitable for one’s goal

pursuit, which will affect evaluations. For example, being thirsty made participants come up with more positive automatic evaluations for products highly suitable for quenching thirst (e.g. water and juice) but not for products only moderately suitable for quenching thirst (e.g. coffee and beer; Ferguson & Bargh, 2004). Thus, although all could be categorized as beverages and hence, at least semantically, linked to quenching thirst, only products highly suitable for quenching thirst elicited positive evaluations among thirsty participants (Ferguson & Bargh, 2004). In another study, although all being foods, only breakfast foods but not dinner foods were evaluated as more attractive by hungry than not hungry participants when tested in the morning, whereas the same effects were found for dinner foods but not for breakfast foods when tested in the evening (Markman et al., 2007). We can therefore predict that although described as pro-environmental, different types of products will elicit different effects of biospheric values on evaluations, depending on the extent to which these products are seen as facilitating pro-environmental goals.

We expect biospheric values to have different effects on evaluations of particularly virtue and vice products. Based on literature, we conceptualise virtue products as fulfilling the overarching normative goal and its sub-goals (e.g. good health), whereas we conceptualise vice products as fulfilling the overarching hedonic goal and its sub-goals (e.g. indulgence; Dhar & Wertenbroch, 2000; Khan & Dhar, 2006; Okada, 2005; Sela, Berger, & Liu, 2009; Wertenbroch, 1998). Pro-environmental goals are sub-goals of the normative goal, as they typically imply giving up one's (short-term) interests for the sake of the environment (see also Eskine, 2013; Thøgersen, 1996). Thus, pro-environmental goals are different from the sub-goals of the hedonic goal, which makes one focus on immediate pleasures and feeling good right now (Lindenberg & Steg, 2007; 2013; Steg, et al., in press). Accordingly, we expect consumers to perceive virtue products as better facilitating the pursuit of normative pro-environmental goals than vice products. In a

related study, respondents were less likely to evaluate products with health claims as beneficial to them if these were vice products (i.e. biscuits) than when these were staple (and hence more virtue) products (i.e. bread and pasta; Dean et al., 2007). Similarly, although all had health attributes, products like yoghurt, margarine, and bread were evaluated more positively than products like ice-cream and chewing gum (Van Kleef, Van Trijp, & Luning, 2005). If virtue and vice qualities of products are indeed associated with overarching normative and hedonic goals, we would expect them to influence not only the perceived healthiness but also the perceived environmental impact of the relevant products. Accordingly, we expect that the virtue-vice distinction will moderate the effects of biospheric values on evaluations of pro-environmental products. Specifically, although all described as pro-environmental, virtue products are more likely to elicit positive evaluations among consumers with strong biospheric values (when compared to consumers with weak biospheric values) than vice products, because the former products are judged as better facilitating pro-environmental goals than the latter products.

3.1.4. Halo effects of the goal-based valence on product evaluations

The next question concerns the scope of goal and value effects on product evaluations. Provided that information on pro-environmental product attributes and strong biospheric values strengthen pro-environmental goals in a situation, how will this translate into actual product evaluations? So far, goals have been shown to impact overall positive or negative evaluation of products, as expressed in product preference (e.g. Brendl et al., 2003; Chartrand et al., 2008; Nisbett & Kanouse, 1969), perceived attractiveness of products (e.g. Brendl et al., 2003; Markman et al., 2007), implicit product evaluations (e.g. Ferguson & Bargh, 2004), and affect towards products (e.g. Fishbach et al., 2004). We aim to extend previous research and test whether goal-based valence can also spread to evaluations of specific product characteristics that may not be directly related to the goal, thus creating a

halo effect (cf. Beckwith, Kassarjian, & Lehmann, 1978). This assumption is derived from the reasoning that goal-based valence can elicit implicit associations (cf. Verges & Duffy, 2009). There is initial evidence to support this prediction. For example, attaching pro-environmental information to food products resulted in these products being evaluated not only as more animal-friendly, better for nature, and more expensive, but also as safer, healthier, and tastier (Hoogland et al., 2007; see also Schuldt & Schwarz, 2010). Interestingly, information on fair-trade attributes too resulted in more favourable product evaluations in terms of healthiness (Schuldt, Muller, & Schwarz, 2012) and, in a recent study, tastiness (Lotz, Christandl, & Fetchenhauer, 2013). Next, stronger biospheric values were linked to evaluating organically grown food more positively on various characteristics, such as tastiness, healthiness, and quality (Dreezens, Martijn, Tenbült, Kok, & De Vries, 2005; Thøgersen, 2011; Thøgersen & Zhou, 2012). Thus, product information and values were in some cases found to induce positive halo effects on product evaluations. The question remains, however, under which conditions such positive halo effects occur. Our conceptual framework allows specifying these conditions and implies that goal-based valence drives a positive halo effect when a goal is strong (on the basis of values and situational cues) and when a product is seen as facilitating that goal. Even if a goal is strong, the positive halo effect is unlikely (or even a negative halo effect might occur) if the product is not seen as facilitating the goal (see Fishbach et al., 2004).

3.1.5. Testing the conceptual framework that explains evaluations of pro-environmental food products

By integrating goal theory and value theory, we propose a conceptual framework that explains evaluations of pro-environmental food products (see Figure 1), which we tested in a series of studies. In Study 1, we tested the baseline assumption that, although both described as pro-environmental, virtue products are seen as better facilitating pro-

environmental goals than vice products. Next, we tested the key argument in our conceptual framework, namely that information on pro-environmental product attributes strengthens pro-environmental goals among consumers with strong biospheric values who then evaluate the product according to how well it facilitates these goals. More specifically, in Study 2, we tested the hypothesis that if a product is seen as facilitating pro-environmental goals (i.e. a virtue product), consumers with strong biospheric (when compared to consumers with weak biospheric values) will evaluate it more positively on various characteristics, due to a positive halo effect. In Study 3, we tested the hypothesis that if a product is not seen as facilitating pro-environmental goals (i.e. a vice product), stronger biospheric values will not yield such a positive halo effect on product evaluations; if anything, a negative halo effect might occur.

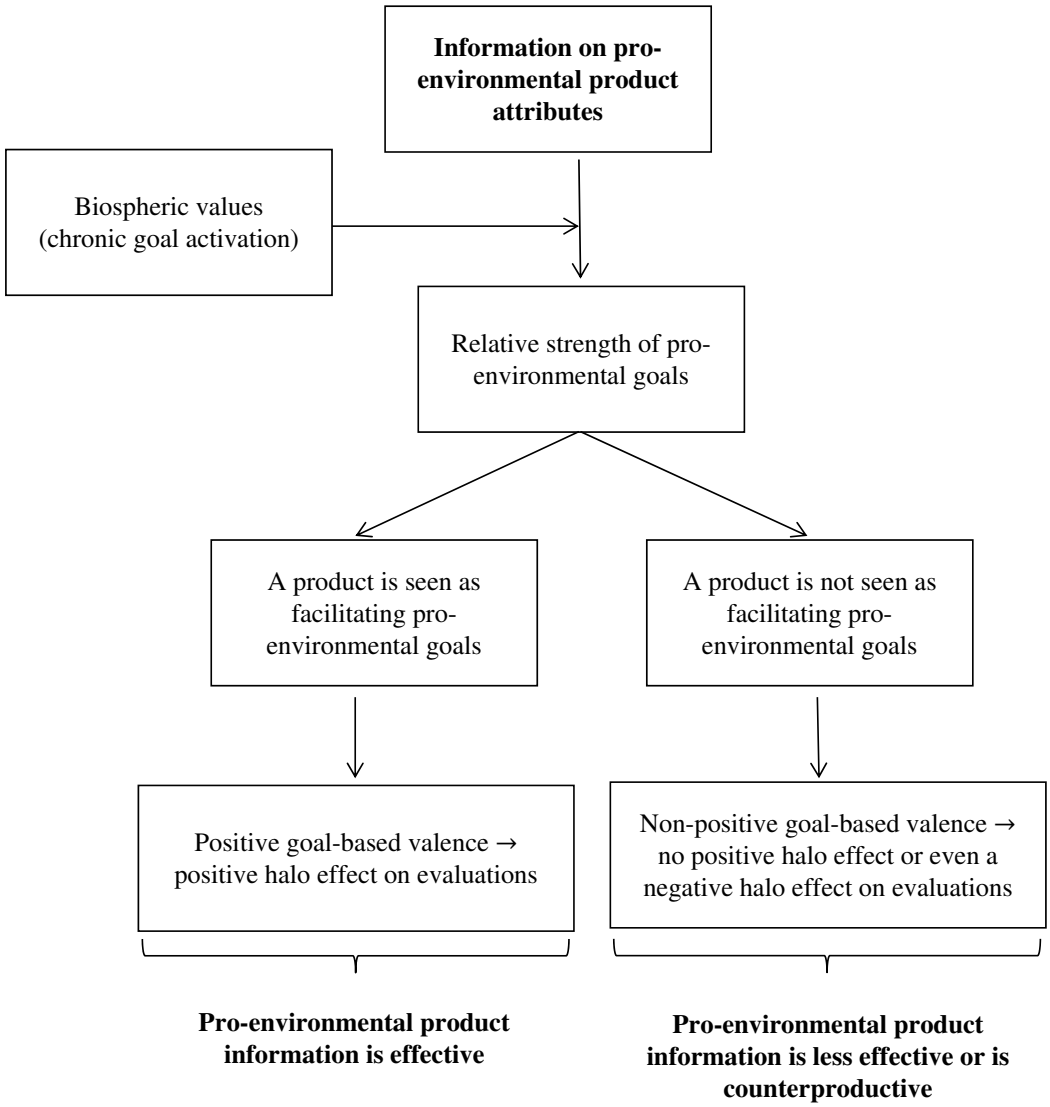

Figure 1. Conceptual framework that explains evaluations of pro-environmental products based on goal theory and value theory.

3.2. Study 1: The extent to which pro-environmental virtue and vice products are seen as facilitating pro-environmental goals

In Study 1, participants evaluated food products according to how good these products are for the environment[c]. All given products were described as pro-environmental. Participants evaluated products with strong virtue qualities, moderate virtue qualities, or vice qualities. We hypothesized that the extent to which products are seen as good for the environment would decrease as a function of a product representing less a virtue product and more a vice product. That would mean that environmental ratings are the highest for strong virtue products, somewhat lower for moderate virtue products, and the lowest for vice products.

3.2.1. Method

Participants and design

Participants were 58 second-year undergraduate students of various disciplines at a Dutch university. One response contained a mild outlier for the ratings of one strong virtue product (i.e. vegetables, lying 1.5 times the interquartile range from the nearest quartile of the response range; Tukey, 1977) and was eliminated. Including this response in the analysis would have substantially reduced the reliability of the evaluations scale for strong virtue products. One response for the ratings of moderate virtue products was incomplete (i.e. missing evaluations for one product) and was excluded when building the overall scale of evaluations of these products. In the same category of moderate virtue products, two responses were eliminated that contained mild outliers for product ratings (lying 1.5 times the interquartile range from the nearest quartile of the response range; Tukey, 1977).

[c] Literally, food products are not "good for the environment", as the consumption of products is always taxing for the environment. However, some products may have relatively lower negative impact on the environment than others. Our participants did not evaluate all products as "not at all good for the environment", which indicates that they indeed considered the relative environmental impact rather than the literal meaning of the evaluation.

Including these responses in the analysis would have substantially reduced the reliability of the evaluations scale for moderate virtue products.

Participants completed a paper-and-pencil study on attitudes towards consumer products. Product type (strong virtue products, moderate virtue products, and vice products) was manipulated in a between-subjects design, whereas in all conditions products were described as pro-environmental.

Materials and procedure

Product type manipulation. We selected virtue and vice products based on the literature on this topic. Strong virtue products were represented by fruit and vegetables, as these products have been referred to as typical virtue products in literature (Chernev, 2011; Sela et al., 2009) and were indeed found to score relatively high on the perceived virtue qualities (Hui, Bradlow, & Fader, 2009; Milkman, Rogers, & Bazerman, 2010; Thomas, Desai, & Seenivasan, 2012). Moderate virtue products were represented by eggs and bread. These products were found to score somewhat lower on the perceived virtue qualities than vegetables and fruit but higher than vice products (Hui et al., 2009; Milkman et al., 2010; Thomas et al., 2012)[d]. Finally, vice products were represented by biscuits, ice-cream, and potato chips (Chernev, 2011; Hui et al., 2009; Milkman et al., 2010; Sela et al., 2009; Thomas et al., 2012). All products were described as pro-environmental (e.g. "fruits are

[d] For explorative reasons, organic meat was provided with strong virtue products and a vegetarian burger was provided with moderate virtue products. While meat might be seen as an important nutrition source and hence as a virtue product by some people, it can be seen as an indulgence by others. Next, some people may consider meat substitutes such as vegetarian burgers as virtue products because they cause less damage for the environment and animals than meat consumption, whereas other people may think that it is more sustainable to reduce meat consumption than to consume meat substitutes. The results showed that meat bears little resemblance to strong virtue products like fruit and vegetables (r = -.09, *ns*), whereas environmental evaluations of the vegetarian burger were similar to those of moderate virtue products, viz. eggs and bread (r = .47, p = .066; M = 3.06, SD = 1.29). Future studies need to clarify the extent to which meat and meat substitutes are seen as virtue or vice products, and how suitable they are perceived to be for attaining pro-environmental goals. We did not include meat and the vegetarian burger in the current analyses.

harvested in organic fruit gardens", "ice-cream is made of milk and eggs coming from an organic farm", "bread is made of organic whole wheat flower")[e].

Environmental ratings. Participants evaluated the given products according to how good they are for the environment[f], on a six-point scale from 0 *not at all* to 5 *very much*. The ratings for products in each category were combined to form composite scales of environmental evaluations for strong virtue products (α [19] = .60), moderate virtue products (α [16] = .53), and vice products (α [19] = .85).

3.2.2. Results and discussion

Mean environmental evaluations for the three types of products are plotted in Figure 2. As expected, pro-environmental products with strong virtue qualities scored highest on being good for the environment (M = 4.47, SD = .59, 95% CI [4.19; 4.76]), followed by products with moderate virtue qualities (M = 3.81, SD = .68, 95% CI [3.45; 4.17]), while vice products had the lowest environmental ratings (M = 2.77, SD = .98, 95% CI [2.30; 3.25]). There was a significant difference in evaluations across the three product categories (F (2, 51) = 23.33, $p < .001$, $\eta p^2 = .478$) and the planned contrasts analysis confirmed that evaluations in each category differed significantly from evaluations in other categories: strong virtue versus moderate virtue: t (29.96) = 3.05, $p = .005$; strong virtue versus vice: t (29.46) = 6.48, $p < .001$; and moderate virtue versus vice: t (31.92) = 3.69, $p = .001$ (Levine's test for equal variances was significant (F = 3.99, p = .025) and degrees of freedom were adjusted accordingly).

[e] We used descriptions and not labels to communicate pro-environmental product attributes, as differences in labels could affect product evaluations. For example, pro-environmental labels need to be trustworthy, recognizable, and meaningful in order to appeal to consumers with strong biospheric values (Horne, 2009; Hoogland et al., 2007; Nilsson, Tunçer, & Thidell, 2004; Thøgersen, Haugaard, & Olesen, 2010). Such labelling effects were outside the scope of the current research.

[f] Participants also evaluated the healthiness and the quality of the products. These measures are not further discussed, as they are not directly relevant for the goals of this study.

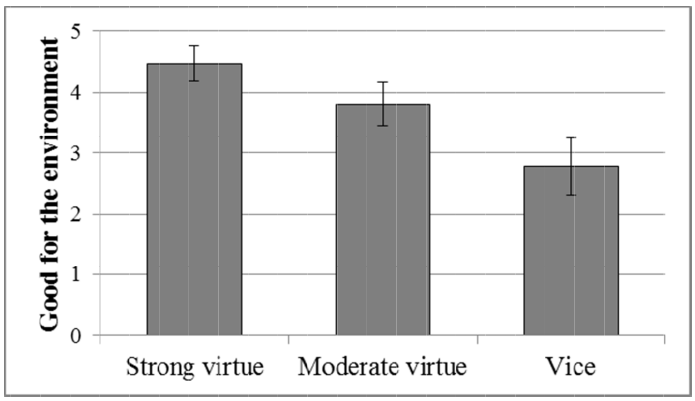

Figure 2. Mean environmental ratings for pro-environmental products with strong virtue qualities, moderate virtue qualities, and vice qualities.

Note. Error bars represent the 95% confidence intervals for the mean environmental ratings.

The results of Study 1 support our baseline assumption that, although all described as pro-environmental, some products are seen as facilitating pro-environmental goals better than others. As expected, the more strongly products represented a virtue product, the more they were seen as good for the environment, whereas vice products received lowest environmental ratings. Having established this, the following step is to test the proposed conceptual framework (see Figure 1), by studying the effects of biospheric values on evaluations of pro-environmental virtue products (Study 2), and next on evaluations of pro-environmental vice products (Study 3).

3.3. Study 2: The effects of biospheric values on evaluations of pro-environmental virtue products

If information on pro-environmental product attributes indeed strengthens pro-environmental goals among consumers with strong biospheric values, we expect these consumers (compared to consumers with weak biospheric values) to evaluate pro-environmental virtue products more positively, since these products are seen as highly suitable for attaining pro-environmental goals (see Study 1). Accordingly, we expected evaluations of various characteristics of pro-environmental virtue products to come under the influence of a positive goal-based valence, due to a halo effect. An interesting question here is whether, besides strong virtue products, moderate virtue products will also receive positive evaluations from consumers with strong biospheric values, or not, since they may be seen as less suitable for attaining pro-environmental goals (see Study 1). Given the reasoning so far, both outcomes are possible, and hence we included both strong and moderate virtue products in Study 2 to find out.

To validate our assumption that (pro-environmental) product information on itself can strengthen associated goals (provided that the corresponding overarching goal is strongly chronically activated, i.e. an important value), we additionally did versus did not prime pro-environmental goals. Specifically, if information on pro-environmental product attributes already strengthens pro-environmental goals among consumers with strong biospheric values, additional goal priming should have no influence on the relationship between biospheric values and product evaluations. Moreover, we checked whether goal priming has the predicted null effects irrespective of the manipulation of delay after the prime, as priming literature maintains that effects of goal priming may get stronger in time (Förster, Liberman, & Friedman, 2007).

3.3.1. Method

Participants and design

Participants were recruited through a website for an online game (eveonline.com) and they could win a voucher for online game-play time (worth approximately 15 euros) for taking part in the study. In total, 132 participants took part in the first study phase, which consisted of a value questionnaire. Of all the responses, six were bogus and therefore 126 participants were invited to participate in the second study phase, a few days later after they have completed the first phase. Of those, 108 completed the entire study. One response was bogus, so the final sample consisted of 107 participants having different nationalities, of whom 99 were men and 8 were women, ranging in age from 18 to 54 (M = 28.7, SD = 7.89).

In the first study phase, participants completed an online questionnaire designed to assess the strength of biospheric values. In the second phase, participants' evaluations of pro-environmental virtue products were measured, after manipulating prime (control versus environmental) and delay after the prime (no delay versus delay) in a between-subjects design. At the end of the entire study participants were debriefed[g].

Materials and procedure

Biospheric values. A short adapted version of Schwartz's value scale (1992) was used to measure participants' values (see Steg et al., in press). Participants received a list of 16 values accompanied by short descriptions and were asked to rate the importance of these values "as guiding principles in their lives" on a 9-point scale ranging from -1 *opposed to*

[g] As part of the general priming procedure, participants were asked at the end of the study whether they recognised any links between the priming task and the following tasks. The responses did not indicate that participants were aware of the purpose of the priming manipulation. The same applies for Study 3.

my principles, 0 *not important*, to 7 *extremely important.* Biospheric values were represented by four items: preventing pollution, respecting the earth, unity with nature, and protecting the environment. Importance ratings for these items were averaged to form a composite scale of biospheric values (α = .91; *M* = 3.83, *SD* = 1.80)[h].

Goal priming manipulation. To (additionally) prime pro-environmental goals, participants were asked to unscramble 22 five-word sentences, and to write down one word that does not belong in a grammatically correct sentence (Srull & Wyer, 1979). In the goal prime condition, 12 words which had to be written down were related to environmental problems (e.g. *pollution*, *deplete*, *extinct*, and *endangered*) and the other words were neutral words (e.g. *compute*, *towers*, *tables*, and *monthly*). In the control prime condition, all words to be written down were neutral words (e.g. *shoe*, *continue*, *delete*, and *towel*).

Delay manipulation. A delay task was either provided before the priming manipulation (no delay) or after the priming manipulation (delay). Participants saw nine pieces of furniture and were asked to rate them (from 0 *not at all* to 3 *very much*) according to a set of characteristics (e.g. originality, practicality). The delay task was estimated to take approximately five minutes.

Product evaluations. All participants read short descriptions and saw pictures of three pro-environmental virtue products: one strong virtue product, namely pro-environmental fruit, and two moderate virtue products, namely pro-environmental eggs and bread, similar to the products we used in Study 1. The strong virtue product was placed in-between the moderate virtue products in the following order: eggs, fruit, and bread. Participants were asked to indicate on a 6-point scale (from 0 *not at all* to 5 *very much*) the extent to which

[h] The value scale also measured altruistic, egoistic, and hedonic values, but those are not further discussed as they are not directly relevant for the goals of this study. When corrected for self-correlations, biospheric value items correlated strongest with the biospheric value scale, indicating that biospheric values were empirically distinguished from other values (see Steg et al., in press). The same applies for Study 3.

they thought the given products could be described by a range of characteristics. To test halo effects, we selected characteristics that do not directly relate to pro-environmental goals but may come under the influence of a positive goal-based valence effect, including characteristics that describe tastiness, healthiness, and attractiveness of products. To avoid repetitiveness, we included synonyms of these characteristics across different products, for example, *delicious*, *tasty*, and *rich in flavour* to describe tastiness; *healthy*, *rich in vitamins*, and *good for me* to describe healthiness; and *attractive*, *tempting*, and *appealing* to describe attractiveness (see Appendix A for the full list of characteristics). For each product, mean scores were computed across all given characteristics to represent overall evaluations of pro-environmental eggs ($\alpha = .92$, $M = 2.91$, $SD = 1.02$), fruit ($\alpha = .94$, $M = 3.52$, $SD = 1.00$), and bread ($\alpha = .92$, $M = 2.99$, $SD = 1.04$), with higher scores indicating more positive evaluations[i].

3.3.2. Results and discussion

Evaluations of each product were regressed on standardized scores for biospheric values, prime (coded -1 for the control prime and 1 for the environmental prime), delay (coded -1 for no delay and 1 for delay), and all corresponding interaction terms. For evaluations of the strong virtue product, the regression model was significant, $R^2 = .14$, F (7, 106) = 2.34, $p = .03$. As expected, the stronger participants' biospheric values, the more positively they evaluated pro-environmental fruit ($\beta = .35$, $p = .001$). Additional priming of pro-environmental goals and the delay manipulation did not affect this relationship, as there were no significant interaction effects (all p's > .05). For moderate virtue products, the model for bread evaluations was also significant, $R^2 = .16$, F (7, 106) = 2.73, $p = .01$. Again, stronger biospheric values resulted in more positive product evaluations ($\beta = .36$, p

[i] Including separate product characteristics in the analyses yielded similar results as analysing combined evaluations. The same applies for Study 3.

< .001), irrespective of the prime and the delay manipulations (all *p*'s for interaction effects > .05). There was also a somewhat positive relationship between biospheric values and evaluations of pro-environmental eggs, but it did not reach significance (β = .16, *p* = .11), despite the prime and the delay manipulations (all *p*'s for interaction effects > .05). Also, the overall model for eggs evaluations was not significant, R^2 = .09, *F* (7, 106) = 1.44, *p* = .20.

The results of Study 2 provide support for the assumption that information on pro-environmental product attributes strengthens pro-environmental goals among consumers with strong biospheric values and elicits positive product evaluations if the product is seen as facilitating pro-environmental goals. Indeed, the stronger their biospheric values, the more positively respondents evaluated pro-environmental strong virtue products, seen as highly suitable for attaining pro-environmental goals (see Study 1). Positive goal-based valence affected evaluations of product characteristics that were not directly related to pro-environmental goals, indicating a halo effect. Interestingly, for moderate virtue products, seen as somewhat less suitable for pro-environmental goal pursuit (see Study 1), stronger biospheric values also had a significant positive effect on evaluations of one product, namely pro-environmental bread, whereas this effect did not reach significance for another product, namely pro-environmental eggs. In the study design, participants were presented with the bread after having evaluated the fruit, whereas the eggs were provided as the first product on the list. This might suggest that, when following strong virtue products, moderate virtue products are seen as more virtue themselves and hence trigger positive evaluations among people with strong biospheric values, whereas they may lose this potential if presented as the first product. This explanation is yet speculative and needs further testing. As expected, priming pro-environmental goals did not change the relationship between biospheric values and product evaluations, which is a further proof

that information on product attributes on itself can strengthen associated goals, provided that the corresponding overarching goals are strongly chronically activated (i.e. important values).

3.4. Study 3: The effects of biospheric values on evaluations of pro-environmental vice products

Study 3 was designed to test the assumption that although information on pro-environmental product attributes can strengthen pro-environmental goals among consumers with strong biospheric values, it will not trigger positive product evaluations if the product is not seen as facilitating pro-environmental goals, namely if it is a vice product (see Study 1) .

Manipulation of pro-environmental goal priming was again introduced. In this case, goal priming was essential in order to see whether the expected null effects of values on product evaluations are indeed driven by the perceived low suitability of vice products for attaining pro-environmental goals. If goals are not primed, one could argue that goals were simply not strong enough to guide evaluations. According to our hypothesis, stronger biospheric values should not lead to more positive evaluations of pro-environmental vice products irrespective of the goal prime manipulation and despite the delay manipulation after the prime.

3.4.1. Method

Participants and design

In total, 136 undergraduate psychology students at a Dutch university took part in a two-phase study in exchange for course credits. Two bogus responses (i.e. writing random

words or rewriting the same sentence in the scrambled sentences task) were excluded, as well as one response that was submitted by the same participant for the second time.

Like Study 2, Study 3 consisted of two parts: the value questionnaire and the actual experiment (both carried out online). The value measure was embedded in a battery of measures, which students could complete throughout the academic year. Subjects could only take part in the experiment provided that they had completed the value measure beforehand[j]. The experiment had a between-subjects design, with prime (control versus environmental) and delay (no delay versus delay) as independent variables and with evaluations of pro-environmental vice products as a dependent variable[k]. At the end of the entire study participants were debriefed.

Materials and procedure

Biospheric values. The same value measure as in Study 2 was used ($\alpha = .86$, $M = 4.47$, $SD = 1.38$).

Goal priming and delay manipulation. The same prime and delay manipulations as in Study 2 were used.

Product evaluations. All participants read short descriptions and saw pictures of three pro-environmental vice products: biscuits, ice-cream, and potato chips, similar to the products we used in Study 1. The order of the first two products was counterbalanced, while the potato chips were always the last product. Participants were asked to indicate on a 6-point scale (from 0 *not at all* to 5 *very much*) the extent to which they thought the given products could be described by a range of characteristics. Since evaluations on various

[j] The time in-between the two parts of the study varied across the participants. Controlling for this variable yielded the same conclusions for the hypotheses.
[k] Product evaluations were followed by other questions about the given products and about product qualities in general, which are not further discussed in this research.

characteristics of a product correlated strongly in Study 2 and all yielded similar effects of biospheric values, we selected ten of these characteristics to use in Study 3 and used the same list for all products. One additional characteristic describing product consistency differed across products: *crunchy* for biscuits, *creamy* for ice-cream, and *crispy* for potato chips (see Appendix A for the full list of characteristics). Mean scores were computed across the given characteristics to represent overall evaluations of pro-environmental biscuits ($\alpha = .86$, $M = 2.74$, $SD = .87$), ice-cream ($\alpha = .85$, $M = 2.91$, $SD = .79$), and potato chips ($\alpha = .83$, $M = 2.20$, $SD = .74$), with higher scores indicating more positive evaluations.

3.4.2. Results and discussion

Evaluations of each product were regressed on standardized scores for biospheric values, prime (coded -1 for the control prime and 1 for the environmental prime), delay (coded -1 for no delay and 1 for delay), and the corresponding interaction terms. None of the three regression models was significant (evaluations of biscuits: $R^2 = .03$, F (7, 132) = .60, *ns*; evaluations of ice-cream: $R^2 = .05$, F (7, 132) = .84, *ns*; evaluations of potato chips: $R^2 = .03$, F (7, 132) = .45, *ns*). As expected, biospheric values did not predict evaluations of pro-environmental vice products, not even when primed and irrespective of the delay manipulation (all p's > .05 for the main effect of values and for interaction effects). Interestingly, when included in the regression models, the order of products (coded -1 for when biscuits were introduced first and 1 for when ice-cream was introduced first) showed a significant effect on evaluations, with evaluations being somewhat higher when ice-cream was evaluated first (evaluations of biscuits: $\beta = .28$, $p = .002$; evaluations of ice-cream: $\beta = .24$, $p = .007$; evaluations of potato chips: $\beta = .17$, $p = .057$). However, controlling for order effects did not change conclusions for our hypotheses, as none of the three regression models became significant, nor did the effects of biospheric values

(including interactions between biospheric values and prime and delay) on product evaluations (all p's > .05).

As expected, people with strong biospheric values did not evaluate pro-environmental vice products more positively than people with weak biospheric values, with the additional prime of pro-environmental goals having no influence on this relationship. This supports our reasoning that, when attached to a vice product, information on pro-environmental attributes strengthens pro-environmental goals among consumers with strong biospheric values, but does not trigger positive product evaluations, because the product is not seen as facilitating pro-environmental goals (see Study 1). In addition, we found order effects on product evaluations, with evaluations for all products being higher when participants first evaluated the ice-cream. It could be that the ice-cream was seen somewhat more favourably than the biscuits, and, eventually, made other products appear in a more positive light. The observed order effects did not depend on participants' biospheric values, which suggests that other product qualities than the perceived environmental impact could have resulted in the ice-cream being seen somewhat more favourably. Explaining what other qualities of vice products could have driven the observed order effects is beyond the scope of the present study; future studies are needed to address this question.

3.5. General Discussion

We integrated goal theory and value theory to explain evaluations of pro-environmental products and, importantly, how information on pro-environmental product attributes might work differently for different types of products (see Figure 1). We argued that people evaluate products based on how well these products facilitate their goals. Sub-goals of three overarching goals, namely a hedonic, gain, and normative goal, may guide product

evaluations (Lindenberg & Steg, 2007; 2013). The strength of these sub-goals depends on situational cues (e.g. product information) and the chronic activation of overarching goals, namely the importance of values.

We argued and found that information on pro-environmental product attributes can strengthen pro-environmental goals among consumers with strong biospheric values. Indeed, additionally priming pro-environmental goals had no influence on the relationship between values and product evaluations. This implies that product information on itself can serve as a cue that activates associated goals, provided that the corresponding overarching goals are strongly chronically activated to people, that is, if they are important values.

Extending earlier studies on this topic, we argued that it is not only the product information itself, but also the extent to which the product is seen as facilitating pro-environmental goals that defines whether or not stronger biospheric values will lead to more positive product evaluations. We predicted and found that virtue products, which fulfil the overarching normative goal, were seen as more suitable for attaining pro-environmental goals than vice products, which mainly fulfil the overarching hedonic goal. In support of our conceptual framework, we found that stronger biospheric values enhanced positive evaluations of pro-environmental products with strong virtue qualities and, to some extent, of pro-environmental products with moderate virtue qualities, but not of pro-environmental vice products.

The proposed framework offers wider theoretical implications for both goal theory and value theory. We showed that situational cues (in this case, information on product attributes) as well as chronic goal activation, namely the importance of values, are important factors defining what type of goals will become strong and guide evaluations in a given situation (see also Hoogland et al., 2005; Verplanken & Holland, 2002). This

implies that goal-related cues may fail to strengthen associated goals if the corresponding overarching goals are not chronically activated to some extent. While we were particularly interested in pro-environmental product information, our reasoning implies that information on other product attributes could strengthen other goals, depending on the chronic activation of (corresponding) overarching goals. For example, salient price information might activate a gain goal and strengthen its sub-goals (e.g. a goal to save money) among people with strong egoistic values (see Steg & De Groot, 2012). This opens the door to an intriguing possibility that the same cue (in this case, information on product attributes) could potentially strengthen different goals among people with different values, and hence be evaluated very differently on the basis of these goals. Future research is needed to test this proposition. Next, the current framework offers important new insights into the workings of values. In theory, values have been conceptualized as goals (e.g., Schwartz, 1992; 1994), but it is unclear how goal qualities could influence the workings of values and their effects on consumers' evaluations. We conceptualise values as chronically activated overarching goals. Certain goals are more likely to become strong in a situation and guide product evaluations if a person strongly endorses a relevant value (see also Hoogland et al., 2005; Maio, 2010; Steg et al., in press; Verplanken & Holland, 2002). Additionally and new to the literature, we introduced an important moderator of the relationship between values and evaluations, namely the extent to which a product is seen as facilitating one's goals. The current findings thus demonstrate that the operation of values is underpinned by goal processes, which can explain why values sometimes do and sometimes do not exert the expected influence on evaluations.

The current findings have important practical implications. Information on pro-environmental product attributes has been increasingly used for product promotion, yet our results imply that the effectiveness of this strategy can vary for different types of products.

Even if people care about pro-environmental product attributes (i.e. they strongly endorse biospheric values), promoting these attributes might be more effective for some products and less effective or even counterproductive for other products. Information on pro-environmental product attributes strengthens pro-environmental goals for people with strong biospheric, and next makes them judge the product according to how well it facilitates these goals. Thus, if attached to virtue products, this information can be effective, as it makes people with strong biospheric values judge the product particularly according to its environmental qualities, which are seen as high for virtue products. However, attaching this information to vice products, and thus making people with strong biospheric values evaluate also these products according to their environmental qualities, might be a less effective or even a counterproductive strategy, as vice products scored relatively low on perceived environmental qualities. Providing no information in this case might even work better, as might attaching information that strengthens "fitting" (i.e. hedonic) goals for such vice products by, say, promoting them as "yummy". Furthermore, our results suggest that product evaluation may also depend on which other products the evaluated product is combined with. We found that pro-environmental moderate virtue products were more likely to trigger positive evaluations among consumers with strong biospheric values when they were presented *after* pro-environmental strong virtue products than when they were presented as the first product on a list. Thus, if products are somewhat ambiguous with regard to how suitable they are for attaining the attribute-related goal, they may benefit from being promoted together with the products that strongly qualify as good means for the goal pursuit. We also observed in Study 3 that merely changing the order in which vice products were introduced affected product evaluations. However, explaining these effects is beyond the scope of this research and requires further investigation.

The current study explicitly reveals goal-based valence transfers to evaluations of various product characteristics that are not directly related to the goal. This poses an interesting puzzle with regard to consumer behaviour. Specifically, could it be that these haloed evaluations become a reason for the eventual product choice? Thøgersen (2011) argued that consumers with strong universalism values (valuing the environment and the well-being of others) purchase pro-environmental products particularly because of the expected environmental benefits, and they only ascribe other benefits (e.g. healthy) to these products afterwards, as a post-hoc justification of their purchase. In the current research, respondents evaluated products without having purchased them, which implies that information on pro-environmental attributes may colour evaluations of various product characteristics from the very beginning. Future studies are needed to see whether and to what extent such haloed evaluations can actually affect product choice.

Future research could take the current findings further in several directions. First, as noted above, it would be interesting to see whether the proposed conceptual model can explain evaluations of products promoted as having other than pro-environmental attributes. We expect the framework to be valid if information on product attributes is related to people's important values, although the virtue-vice distinction might not be the most adequate one in all cases and other product characteristics may better define whether or not a product is seen as facilitating one's goals. Another important question concerns the absolute effect of attaching attribute information when compared to no such information. For example, would virtue products, even if not described as pro-environmental, be already seen as better facilitating the pursuit of pro-environmental goals than vice products? And if so, what is the added value of information on pro-environmental attributes, especially among consumers with strong biospheric values? Even more intriguing is the question whether information on pro-environmental attributes could actually result in a negative

halo effect on evaluations of vice products. Initial evidence that information on pro-environmental attributes could be counterproductive for vice products comes from a study by Van Doorn and Verhoef (2011) who found that an organic claim reduced the perceived quality of vice products. Still, their results suggest a possibility that, while being overall less effective for vice than for virtue products, information on pro-environmental attributes may nevertheless be somewhat more effective for some vice products than for others (as there was an indication of a positive relationship between higher environmental concern and evaluations of the included organic vice products). Future research needs to address this question.

In order to be able to generalize the current results, more studies with representative samples of consumer populations across different cultures are needed. We consider it worthwhile to include (actual) purchase behaviour as another dependent variable, as well as to aim for a replication of the current results for different types of products, including non-food product categories.

Overall, the results indicate that information on pro-environmental product attributes has more complex implications for product evaluations than often anticipated. Even if people value the environment, they may evaluate different types of pro-environmental products differently, which can make the information on pro-environmental attributes either more or less effective. Taking a goal-based approach helps explain the conditions for evaluations of different types of pro-environmental products.

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Appendix A. Characteristics for product evaluations in Study 2 and Study 3.

Characteristics for product evaluations in Study 2:

Eggs: *delicious*, *tender*, *healthy*, *filling*, *appealing*, *of high nutritious value*, *rich in flavour*, and *good for me*.

Fruit: *tasty*, *healthy*, *fresh*, *attractive*, *tempting*, *rich in vitamins*, *high-quality*, and *good for me*.

Bread: *filling*, *delicious*, *healthy*, *mouth-watering*, *of high nutritious value*, *rich in flavour*, *fresh*, *appealing*, and *good for me*.

Characteristics of product evaluations in Study 3:

All products: *delicious, healthy, mouth-watering, good for me, rich in flavour, of high nutritious value, appealing, filling, high-quality*, and *fresh*.

Additional characteristics describing the consistency of each product: *crunchy* for biscuits, *creamy* for ice-cream, and *crispy* for potato chips.

Chapter 4

EXPLAINING EVALUATIONS OF ENERGY ALTERNATIVES: INTEGRATED REVIEW AND RESEARCH AGENDA[a]

[a] This chapter is based on the manuscript submitted for publication: "Contextual and psychological factors shaping evaluations of energy alternatives: Integrated review and research agenda" by Goda Perlaviciute and Linda Steg.

Abstract

In pursuit of sustainable energy transitions, it is important to understand what drives people's evaluations of (sustainable) energy alternatives. We take a goal-based approach to address this question. Energy alternatives entail various characteristics (e.g. environmental impact, price) that fulfil different goals (e.g. protect the environment, save money). We argue that people evaluate energy alternatives based on the implications of these alternatives for their prominent goals, which are rooted in their values. But is there support for this goal-based premise? In this review, we bring together two growing but so far unconnected bodies of research on how characteristics of energy alternatives and psychological factors, particularly values, affect evaluations of energy alternatives. Importantly, we find evidence that people with different values evaluate energy alternatives and their costs and benefits differently. This provides initial support for the premise that people's value-based goals drive their evaluations of energy alternatives. Based on the knowledge developed, we put forward a research agenda for future exploration of (interactions between) the characteristics of energy alternatives and values on evaluations of these alternatives. Next, we discuss policy implications and propose new possibilities for interventions aimed at enhancing sustainable energy transitions, on the basis of this review.

Keywords: energy alternatives; goals; sustainability; values.

4.1. Introduction

Public acceptability is becoming a major issue in the energy domain, especially in relation to sustainable energy transitions. Different types of energy sources have been promoted as (relatively) sustainable, including energy generated from renewable sources such as wind, solar, and hydrogen; nuclear energy; and energy generated from specific types of fossil fuels that are argued to emit less CO_2, such as natural gas. We refer to these energy sources and their surrounding contexts, including the infrastructure, technology, regulations and policies, as *energy alternatives*. Any (sustainable) energy alternative will grind to a halt without sufficient public support, and hence it is important to understand how people develop their evaluations of energy alternatives, and how these evaluations can be influenced to enhance sustainable energy transitions. Based on literature, we define evaluations of energy alternatives as consisting of 1) the perceived costs and benefits of energy alternatives, including the perceived fairness of distribution of costs and benefits and of decision making procedures, and 2) acceptability of energy alternatives, which reflects the extent to which people generally (dis)favour a particular energy alternative[b] (Eagly & Chaiken, 1993). But how do people come up with their perception of costs and benefits of energy alternatives? And which perceived costs and benefits are most important for their acceptability ratings? We take a goal-based approach to address these questions. Energy alternatives entail various characteristics (e.g. environmental impact, price) that fulfil different goals (e.g. protect the environment, save money). We propose that people evaluate energy alternatives based on the implications of these alternatives for their prominent goals. Individual values, which we conceptualise as chronically activated overarching goals, determine which goals are prominent to people when evaluating energy

[b] The current conceptualization of acceptability integrates people's opinion about energy alternatives as well as their (intended) action towards energy alternatives, elsewhere referred to as, respectively, acceptability and acceptance (Huijts, Molin, & Steg, 2012).

alternatives (see Lindenberg & Steg, 2007 for an explanation of the relationship between overarching goals and specific goals in a situation). Energy alternatives may be evaluated differently based on their implications for people's value-based goals. To see whether there is support for our goal-based reasoning, we carried out an extensive review of theoretical and empirical literature on evaluations of energy alternatives. The structure of this review is as follows.

We first report evidence on *how* people perceive costs and benefits of various energy alternatives, and to what extent they perceive the distribution of these costs and benefits and the decision procedures to be fair, and *how* this relates to acceptability. Different energy alternatives are seen as having different collective (e.g. environmental impact) and individual (e.g. expensiveness) costs and benefits, which both may affect acceptability. The perceived fairness of the distribution of costs and benefits and of decision making processes can also influence acceptability, especially when energy alternatives are implemented within a certain community.

Next, we focus on *why* people hold certain evaluations of energy alternatives, and whether there is evidence to support the goal-based reasoning. Figure 1 illustrates the conceptual framework that explains evaluations of energy alternatives, which is based on literature. Two key factors shaping evaluations of energy alternatives are identified in literature, namely the *characteristics of energy alternatives* and *psychological factors* (see Figure 1). The characteristics of energy alternatives are objective and defined by context[c]. In terms of the goal-based approach, they define the costs and benefits of energy alternatives, which can enable people to fulfil their various goals. We review collective

[c] It is beyond the scope of this article to discuss macro-level factors shaping evaluations of energy alternatives, such as economic developments, demographic developments (e.g. population growth), institutional factors (e.g. energy and other policies), and cultural developments (Abrahamse, Steg, Vlek, & Rothengatter, 2005; Gatersleben & Vlek, 1998). We focus on the characteristics of energy alternatives, while acknowledging that these characteristics are embedded in wider societal, economic, cultural, and political contexts.

costs and benefits (i.e. *environmental impact* and *safety of operation*), individual costs and benefits (i.e. *price*, *quality of energy supply*, and *physical characteristics*), and fairness-related characteristics (i.e. *spatial proximity*, *compensation strategies*, and *fair procedures*) of energy alternatives and their effects on evaluations of these alternatives[d].

According to literature, the following psychological factors shape evaluations of energy alternatives: *place-attachment and place identity*, *trust,* and *values.* Place-attachment and place-identity and trust are situation-specific factors. They vary depending on, for example, the location for energy facility siting, the type of energy alternatives, and the responsible actors. Values, on the other hand, can be conceptualised as chronically activated overarching goals that define what people find important in their lives in general. Values are therefore not bound to a specific situation or a specific energy alternative. "Overarching" means that values determine which specific sub-goals are most prominent to people across situations (Lindenberg & Steg, 2007). We expect that people evaluate energy alternatives based on the implications of these alternatives for the goals that are most prominent to them given their values.

The characteristics of energy alternatives and psychological factors, particularly values, have mostly been studied separately so far. We therefore include them as independent predictors in the conceptual framework (see Figure 1). We argue, however, that these factors interact when shaping evaluations of energy alternatives and need to be studied in combination. We will discuss this when developing a research agenda. Based on the literature review, we will provide policy implications for addressing evaluations of (sustainable) energy alternatives.

[d] Even given the same characteristics of energy alternatives, people may *perceive* the costs and benefits of these alternatives differently, as we will explain later in the paper.

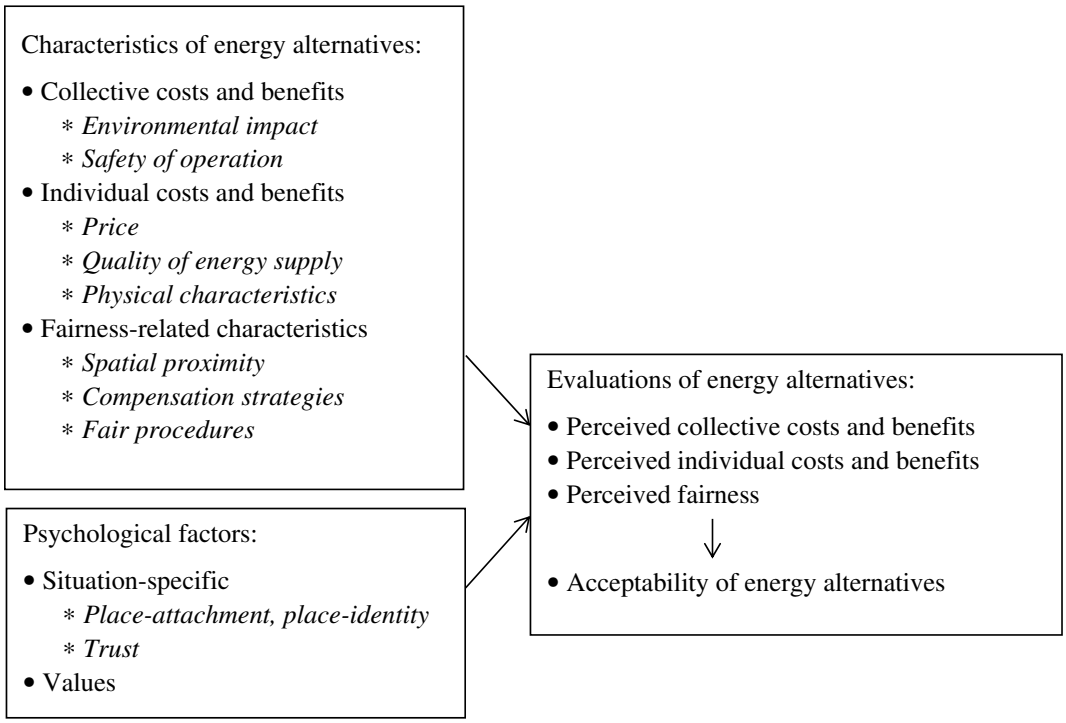

Figure 1. Conceptual framework that explains evaluations of energy alternatives, based on literature.

Note. The framework reflects how characteristics of energy alternatives and psychological factors, particularly values, have been addressed so far in the literature, namely as independent predictors. Yet, the goal-based approach implies that these factors interact when shaping evaluations of energy alternatives and should therefore be studied in combination; we elaborate on this in the research agenda presented later in this paper.

4.2. Evaluations of energy alternatives: Perceived costs and benefits, perceived fairness, and acceptability ratings

People perceive energy alternatives as having certain costs and/or benefits. A distinction can be made between perceived *collective costs and benefits*, which reflect perceived consequences for societal factors including public safety and the environment, and perceived *individual costs and benefits*, which reflect perceived consequences for individual resources such as money, comfort, time, and effort. Both types of perceived costs and benefits fulfil various goals of people and are therefore relevant for their acceptability ratings (Lindenberg & Steg, 2007, 2013; Steg, Bolderdijk, Keizer, & Perlaviciute, in press). Importantly, however, energy alternatives hardly ever have only costs or only benefits and there is often a conflict between (perceived) collective and individual consequences, as we demonstrate below.

4.2.1. Perceived collective costs and benefits of energy alternatives

People tend to ascribe high collective costs and low collective benefits to fossil fuels, including oil, coal, and gas, and to nuclear energy, whereas they tend to associate renewable energy sources with high collective benefits and low collective costs. Fossil fuels are typically evaluated as polluting, contributing to climate change, finite, and causing global conflicts, whilst nuclear energy bears additional associations with atomic weaponry, radioactive waste disposal, and nuclear accidents (Butler, Parkhill, & Pidgeon, 2013; Corner, Venables, Spence, Poortinga, Demski, & Pidgeon, 2011; Parkhill, Demski, Butler, Spence, & Pidgeon, 2013; Spence, Poortinga, Pidgeon, & Lorenzoni, 2010). Renewable energy sources, in contrast, are typically evaluated as safe and clean (Arkesteijn & Oerlemans, 2005; Butler et al., 2013; Devine-Wright, 2003; Parkhill et al., 2013; Poortinga, Pidgeon, & Lorenzoni, 2006). This, however, mostly applies to wind and

solar energy and less to other types of renewable energy alternatives. For example, people associate bio-energy with fossil fuels, due to the involved process of burning materials, and they thus do not see it as a very sustainable energy alternative (Butler et al., 2013). Next, bio-energy was found to raise public concerns about food security (Halder et al., 2012). Interestingly, only about 55% of the asked respondents recognised biomass as a renewable energy source, about 72% recognised geothermal heat and about 77% recognised hydro energy as renewables, while most respondents recognised solar (about 88%) and wind (about 93%) energy as renewable energy alternatives (Devine-Wright, 2003).

4.2.2. Perceived individual costs and benefits of energy alternatives

When it comes to individual costs and benefits, renewable energy alternatives are evaluated somewhat less positively. Indeed, people expect energy from renewables to be relatively pricy (Arkesteijn & Oerlemans, 2005). Besides the (supposed) expensiveness, wind energy has been associated with noise, spoiled scenery, and unreliable energy supply (Wolsink, 2000). Electric heating systems in houses, which may have to replace gas heating systems when implementing renewable energy, were judged "expensive, not controllable, non-responsive, and ineffective" (Butler et al., 2013, p. 39; see also Parkhill et al., 2013). In comparison, fossil fuels, and especially gas, are evaluated more favourably and are seen by people as effective and reliable sources for their daily energy needs (Butler et al., 2013; Parkhill, 2013). At the same time, there seems to be some ambiguity in people's evaluations of some individual costs and benefits of energy alternatives. For example, respondents were rather undecided (ratings close to the mid-point "neither agree nor disagree") in their evaluations of renewable energy sources, nuclear power, and fossil fuels in terms of reliability, job creation, and expenses (Devine-Wright, 2003). In addition, and in contrast to the findings reported above, in some studies renewable energy sources are actually evaluated by many as relatively cheap (Poortinga et al., 2006).

So, different energy alternatives may be perceived by people as rather beneficial for some aspects (i.e. collective or individual) and as rather costly for other aspects, and hence as having different implications for their various goals. Below, we first review evidence on how these different perceptions relate to acceptability of energy alternatives. Next, we look at how perceived fairness relates to acceptability of energy alternatives.

4.2.3. The relationship between perceived costs and benefits and acceptability of energy alternatives

In general, the higher costs people ascribe to an energy alternative, the lower their acceptability, whereas the higher benefits they expect, the higher their acceptability, be it collective or individual costs and benefits (see Huijts et al., 2012). For example, acceptability of solar and wind energy, energy produced from coal, and nuclear energy was lower when people believed that a given energy alternative contributes to climate change, whereas acceptability was higher if people believed that energy alternatives increase a country's energy independence (Culley, Carton, Weaver, Ogley-Oliver, & Street, 2011). The higher price participants expected to pay for green electricity when compared to conventional electricity, the less they were willing to adopt green electricity (Arkestijn & Oerlemans, 2005). The more benefits in terms of energy price, energy security, and reduced CO_2 emissions, and the lower risks for safety, health, and the environment people associated with nuclear energy, the higher were their acceptability ratings (De Groot & Steg, 2010; De Groot, Steg, & Poortinga, 2012; Visschers, Keller, & Siegrist, 2011). In another study, acceptability of carbon capture and storage technology (CCS) was lower the more the public associated it with unforeseeable future problems (putting pollution somewhere else rather than reducing it), disturbing nature, and increasing reliance on fossil fuels; whereas acceptability of CCS was higher the more people evaluated it as allowing to use current resources while reducing CO_2 levels, giving time to find more sustainable

solutions, and making a better way of living for future generations (Palmgren, Morgan, De Bruin, & Keith, 2004; see also Terwel & Daamen, 2012).

Sometimes perceived benefits while other times perceived costs are better predictors of acceptability of energy alternatives. For example, positive evaluations of social, personal, and environmental outcomes (combined measure) more strongly predicted acceptability of electricity generation from fossil fuels, nuclear energy, and hydroelectricity (Bronfman, Jiménez, Arévalo, & Cifuentes, 2012) and CO_2 storage (Midden & Huijts, 2009) than negative evaluations of these outcomes. In contrast, particularly perceived costs seem to predict acceptability of radioactive waste disposals (see De Groot & Steg, 2011). This implies that knowing solely what costs and benefits people associate with a certain energy alternative does not yet allow one to predict acceptability of that alternative, as some (collective and/or individual) costs and benefits may have higher impact on acceptability than others.

Interestingly, people are not always accurate when judging which costs and benefits influence their acceptability ratings. For example, although respondents rated the environmental impact as the most important aspect of wind farms and hence more important than the visual impact, the visual impact turned out to explain most variance in support for wind energy (Wolsink, 2007). In another study, respondents ascribed relatively much importance to so-called instrumental aspects of local renewable energy systems, such as price and comfort, and to environmental aspects, whereas they ascribed relatively little importance to so-called symbolic aspects that indicate how much local renewable energy systems fit their personality and enable them to distinguish themselves from others (Noppers, Keizer, Bolderdijk, & Steg, under review). Interestingly, however, particularly the symbolic aspects, next to the environmental aspects, predicted respondents' intention to adopt local renewable energy systems, whereas their beliefs about instrumental aspects of

these energy systems had virtually no influence on their intention to adopt when the other aspects were controlled for (Noppers et al., under review). This suggests that comprehensive research designs are needed to examine which costs and benefits have most influence on acceptability of energy alternatives, as people may not always be accurate about their true motives. Next, we argue that the knowledge of people's chronic overarching goals (i.e. their values) can inform us which (perceived) costs and benefits of energy alternatives truly guide acceptability ratings. We will come back to this proposition later in this paper.

4.2.4. The relationship between perceived fairness and acceptability of energy alternatives

Not only the perceived costs and benefits per se, but also the extent to which costs and benefits are believed to be distributed fairly across groups in society, that is, perceived *distributive fairness*, can influence acceptability (Schuitema & Bergstad, 2013). Perceived distributive fairness reflects how people evaluate the balance between the costs that a certain group faces and the benefits it receives, in comparison to other groups (Tyler, 2000). This is particularly relevant when implementing energy alternatives within a community. If the host community bears many costs (e.g. noise, disturbed landscape, risks in case of accidents) and other groups in society mainly receive the benefits (e.g. energy security, economic growth, reduced CO_2 emissions) and little direct costs, perceived distributive fairness, and hence acceptability of energy alternatives, might be low. In one study, seeing risks as unfair and, particularly, perceiving high risks to the health of local people reduced support for a nuclear waste repository (Sjöberg & Drottz-Sjöberg, 2001). Another study explored several cases of implementing renewable energy alternatives within local communities and found that a wind farm project was viewed rather negatively in a community where people thought that most of the benefits were flowing to a few local farmers rather than to the whole community (Walker, Devine-Wright, Hunter, High, &

Evans, 2010). In contrast, people in another community expressed rather positive views towards a ground source heat pump technology that was believed to enable all community members to use a well-heated village hall (Walker et al., 2010). Besides equal benefits from the project, the latter community also reported fairer decision making process than the former community, which could (partly) account for different views towards each project (Walker et al., 2010); we elaborate on perceived procedural fairness below.

The extent to which people believe that decisions regarding (implementation of) energy alternatives are taken in a fair way, that is, perceived *procedural fairness*, is another important factor for acceptability (Schuitema & Bergstad, 2013; Tyler, 2000). Indeed, if asked, citizens emphasise that a fair decision making process is important to them. For example, before as well as after the implementation of a wind farm project in South Wales (the UK), the majority of citizens agreed with the statement "Wind farms should always be developed in partnership with local communities" (Devine-Wright, 2005a). In an Australian study on acceptability of a wind farm project, people were concerned with the fairness of decision making procedures being employed (e.g. adequate information, possibility to participate and to be heard) and considered that important for their acceptability judgements (Gross, 2007). A review of other studies on renewable energy developments revealed that, in general, people wish to be informed about and to have a say in these developments, although only a minority expect their views to be taken seriously by decision makers (Devine-Wright, 2005b). It is useful to consider, however, that the extent to which people rate certain aspects as important does not necessarily correspond to the actual impact of these aspects on their acceptability ratings, as mentioned before (Noppers et al., under review; Wolsink, 2007). Yet, case studies in Switzerland (Krütli, Flüeler, Stauffacher, Wiek, & Scholz, 2010), Germany (Hocke & Renn, 2009), and Native American communities (Gowda & Easterling, 2000) suggest that lack of perceived

procedural fairness could have (partly) accounted for public opposition towards nuclear waste disposals. A study on acceptability of CCS in Barendrecht (the Netherlands) measured the perceived (un)fairness of decision making processes, as well as the perceived influence of energy industry and local people in decision making, and found that these perceptions explained a substantial proportion of the variance in generally rather negative attitudes towards the CCS project, next to perceived safety, trust in decision makers, and people's expected fall in property value (Terwel, Ter Mors, & Daamen, 2012).

The studies reviewed so far provide important insight into *how* people perceive collective and individual costs and benefits and fairness of various energy alternatives, and *how* these perceptions relate to their acceptability ratings. The next question is *why* people evaluate energy alternatives in the way they do, and *why* certain (perceived) costs and benefits sometimes play a larger role in acceptability ratings than others. Below, we will discuss two key factors that have been argued to have important influence on evaluations of energy alternatives, namely characteristics of energy alternatives and psychological factors, particularly values. We will look whether there is evidence to support our goal-based reasoning. Specifically, can we find that people evaluate energy alternatives differently, depending on the implications of these alternatives for their value-based goals?

4.3. Characteristics of energy alternatives shaping evaluations of energy alternatives

Every energy alternative comes with its different characteristics that are determined by the context and "delivered" to people upon implementation of these alternatives. In terms of the goal-based approach, these characteristics imply certain costs and benefits to people's various goals and hence are important for acceptability. Changing the characteristics of energy alternatives, so as to reduce the costs and increase the benefits, could promote acceptability. Such changes are particularly important when severe barriers for

acceptability exist (e.g. unaffordable price, hazardous pollution levels; see McAllister, Van Praag, Van Soest, & Henderson, 2010; Thøgersen, 2005). Importantly, if the goal-based reasoning holds, different people may attend to different characteristics of energy alternatives. Specifically, they will attend particularly to the costs and benefits for their prominent goals, which are determined by their values. We will elaborate on this later in this article. Below, we review some key collective costs and benefits (*environmental impact* and *safety of operation*) and individual costs and benefits (*price*, *quality of energy supply*, and *physical characteristics*) of energy alternatives and describe how they relate to acceptability[e]. Next, we discuss fairness-related characteristic of energy alternatives (*spatial proximity*, *compensation*, and *fair procedures*) and their effects on acceptability.

4.3.1. Collective costs and benefits of energy alternatives

4.3.1.1. Environmental impact

It is a highly complex task to assess environmental impact of energy alternatives throughout their life cycle, and even experts tend to disagree on that. This makes studying the effects of *actual* environmental impact of energy alternatives on acceptability difficult, and it typically boils down to exploring how people evaluate energy alternatives that have been *claimed* to have a relatively low or high environmental impact. As said before, people perceive renewable energy sources as having lower environmental impact than fossil fuels and nuclear energy. However, it is unclear which exact indicators of environmental impact (e.g. CO_2 emissions, waste materials) account for these differences. For example, nuclear energy has been long promoted as a low-carbon energy alternative, but it is nevertheless perceived as having relatively large contribution to climate change, larger than renewable

[e] Distinguishing between collective and individual costs and benefits of energy alternatives is somewhat artificial, as these factors may be related. For example, CO_2 emissions may not only have implications for the environment but also affect individuals (e.g. air quality). Nevertheless, we consider this distinction useful for a systematic literature review, and we focus on collective and individual costs and benefits that have been mostly addressed as such in literature.

energy, although somewhat smaller than energy produced from coal (Culley et al., 2011). Also in other studies nuclear energy scored rather low on perceived environmental benefits, with people only "reluctantly" accepting it if having come to a conclusion that there is no other way to combat climate change and at the same time expressing strong preference for alternative sustainable solutions (Bickerstaff, Lorenzoni, Pidgeon, Poortinga, & Simmons, 2008; Corner et al., 2011; Pidgeon, Lorenzoni, & Poortinga, 2008). Interestingly, an experimental framing (versus no framing) of nuclear energy as a potential solution to climate change had hardly any effect on acceptability (Pidgeon et al., 2008). However, the experimental framing condition included a statement about both pros and cons of nuclear energy for mitigating climate change (while the control condition had no such statements), which could have balanced out the positive and the negative effects of this framing on acceptability (Pidgeon et al., 2008). In the same study, evaluations were somewhat more positive when made upon the condition that new nuclear power stations would help solve climate problems, than when evaluating nuclear power per se. However, it is unclear to what extent this difference was driven merely by the clause "if it would help" rather than by actually considering nuclear energy as a sustainable energy source (Pidgeon et al., 2008). Future studies should follow up this work and specify the effects of (claimed) environmental impact on acceptability of energy alternatives, and the unique effects of different indicators of environmental impact (e.g. CO_2 emissions, waste materials). Notably, certain types of fossil fuels, such as natural gas and shale gas, have been promoted as having relatively low environmental impact. Some preliminary evidence indicates that natural gas is seen as somewhat more environmentally friendly than other fossil fuels (Devine-Wright, 2003), but nevertheless evaluated as dirty and contaminating (Blauw research, 2011). Research on perceived environmental impact and acceptability of shale gas is still at its infancy, but there is evidence to suggest that it is associated more

with environmental costs rather than benefits, especially by opponents (Clarke, Boudet, & Bugden, 2013; Editorial: Fracking fracas, 2013). Next, a study found that informing people about the possibility to reduce CO_2 emissions in the atmosphere by implementing a CCS technology increased acceptability of this technology, although acceptability also depended on other factors, such as whether or not CCS is combined with renewable energy sources to reduce CO_2 (Shackley, McLachlan, & Gough, 2004). People saw some environmental benefits of CCS (e.g. abating climate change, "buying time" to develop other solutions), but they doubted whether it could be a long-term sustainable solution and associated it with high risks for public health and the environment (e.g. accidents, leakage; Shackley et al., 2004).

4.3.1.2. Safety of operation

Safety of operation can influence how people evaluate implications of energy alternatives for public health, as well as for the environment. Like with environmental impact, it is difficult to evaluate actual safety of operation for energy alternatives, as in most cases it means assessment of potential risks rather than facts. One way to study the effects of safety of operation on acceptability is by measuring acceptability before and after safety is violated, as, for example, in case of nuclear accidents. A decrease in support for nuclear energy was observed after the three major nuclear accidents, namely the Three-mile Island, Chernobyl, and Fukushima (Butler, Parkhill, & Pidgeon, 2011; Prati & Zani, 2012) and after a nuclear accident in Tokai, Japan (Katsuya, 2001). Interestingly, however, one study found rather moderate negative effects of the Fukushima accident on acceptability of nuclear energy (measured before, immediately after, and half a year after the accident) and observed that people held similar attitudes towards this energy alternative before and after the accident (Siegrist & Visschers, 2012). Such robust attitudes may be rooted in psychological factors, particularly values, described later in this article. At the same time,

acceptability of energy alternatives could be based on the *individual* costs and benefits of these alternatives, as described below.

4.3.2. Individual costs and benefits of energy alternatives

4.3.2.1. Price

Energy costs can be an important characteristic influencing acceptability. Public surveys indeed indicate that people are not in favour of paying a higher price for a preferred energy alternative (McGowan & Sauter, 2005). Note, however, that people may be motivated to indicate that they are willing to pay less than they would actually find acceptable, so as to steer policy making and achieve lower energy prices. In fact, when provided with future clean energy scenarios (80% clean energy by the year 2035) with a certain increase in their energy bill (8 different amounts varied in a between-subjects design, from min. US$5 to max. US$155), the majority of respondents supported the scenarios, although support decreased gradually from over 70% supporting an increase of US$5-35 to approximately 50% supporting an increase of US$135-155 (Aldy, Kotchen, & Leiserowitz, 2012). Interestingly, respondents were somewhat more likely to support energy systems that solely relied on renewable energy than energy systems that also included gas or nuclear energy (Aldy et al., 2012). There is more evidence to suggest that people find rises in energy bills more acceptable if they are to pay for relatively desirable elements, such as renewable energy, than for relatively unwanted elements, such as fossil fuels (Butler et al., 2013; Parkhill et al al., 2013). Besides the absolute price, other cost aspects may influence acceptability, for example, people prefer stable over unstable energy prices, even if that costs them more money in the end (Butler et al., 2013; Parkhill et al al., 2013).

4.3.2.2. Quality of energy supply

Quality of energy supply can have implications for people's daily comfort and hence affect

acceptability. Renewable energy sources are characterised by intermittency, meaning that they can encompass shortages, delays, and shut-downs in energy supply, which might reduce acceptability (Buttler et al., 2013; Wolsink, 2012). To use renewable energy, people may need to adjust their behaviours to availability of energy (e.g. shifting energy use to times where energy is produced abundantly). Deriving from literature on acceptability of energy policies (Steg, Dreijerink, & Abrahamse, 2006), it might be seen as too effortful by people and reduce their acceptability of renewable energy alternatives. Energy technology can play an important role here and facilitate new and/or different energy consumption behaviours by making these behaviours easier, helping people learn and monitor their behaviours, and even activating social behavioural norms (Midden & Ham, 2013). For example, when a "Smart Wash" technology informed people about energy availability and, if people wanted, autonomously regulated their laundry times, people indeed started matching their laundry times and, in some cases, even other electricity consumption behaviours (e.g. the use of dryer, dishwasher) with availability of local solar electricity (Kobus, Mugge, & Schoormans, 2013). Thus, energy alternatives may be more acceptable if they can be adopted and used easily and do not interrupt the rhythms of people's everyday life.

4.3.2.3. Physical characteristics

Physical characteristics of energy alternatives may influence people's evaluations of, for example, aesthetics and noise. Sometimes it might be difficult to pinpoint which physical characteristics account for which evaluations. For example, it was suggested that people's perceived sound annoyance from wind turbines can be influenced by their perceived visual interference of wind turbines (Pedersen & Waye, 2004). A review of studies on perceptions of wind farms revealed a clear tendency of people to prefer small-scale wind farms over large-scale developments (Devine-Wright, 2005b). Next, higher levels of support were

found for offshore than for onshore wind farms (Parkhill et al., 2013). However, it is not clear what type of evaluations (e.g. aesthetics, noise, disturbance of landscape) drive these preferences; more (experimental) studies are needed to explore this in depth.

4.3.3. Fairness-related characteristics

4.3.3.1. Spatial proximity

Perceived distributive fairness of energy alternatives might be low if a host community bears all the costs while other groups in society enjoy solely the benefits. Therefore, spatial proximity to energy alternatives has been considered as an important factor for acceptability, giving roots to a so-called NIMBY (Not In My BackYard) phenomenon. The NIMBY implies that people may accept energy alternatives in general, but not when these alternatives are deployed in their immediate vicinity. For example, while people generally express much support towards renewable energy, actual implementation of renewable energy facilities (e.g. wind farms) is often met with opposition (Devine-Wright, 2005b; Wolsink, 2007). Similarly, attitudes towards CO_2 storage in general were more positive than attitudes towards CO_2 storage in one's immediate vicinity (Huijts, Midden, & Meijnders, 2007; Midden & Huijts, 2009). It must be noted, however, that NIMBY can be a highly over-simplified and misleading concept, as it always explains low acceptability in terms of a sole motive to not have energy alternatives in one's vicinity. At the same time, it downplays potential genuine concerns of (local) people with regard to collective risks for the environment and future generations, trust in regulators, and perceived distributive and procedural fairness (Devine-Wright, 2005b; 2009; Wolsink, 2007). A comparison between evaluations of energy alternatives in general versus a specific energy development in one's backyard is not a valid one for concluding the NIMBY effect, since the costs and benefits of a specific project are not brought into people's consideration when asking for their

evaluations in general. In fact, a study using a between-subjects design to measure acceptability of CCS either in one's close vicinity or somewhere else did not find support for the NIMBY effect, as respondents in both experimental groups were equally inclined to protest again CCS (Terwel & Daamen, 2012). The less they trusted the government and the more they associated CCS with collective risks rather than collective benefits, the more inclined people were to protest against CCS, irrespective of whether it would be implemented within or outside their residential area. Only the perceived risk to the safety of local people predicted protesting intentions better among onsite residents than offsite residents (Terwel & Daamen, 2012). Interestingly, people tend to mostly object *new* energy developments in their locality, whereas people living close to *existing* energy alternatives generally do not report lower acceptability ratings and even report higher acceptability ratings than people living farther away (Devine-Wright, 2005; 2009) or than what they reported before the energy facility was implemented (Wolsink, 2007). The reason why local people would evaluate existing energy alternatives more positively (or, rather, less negatively) than planned energy alternatives is unclear and requires further investigation.

4.3.3.2. Compensation strategies

If relatively high costs of energy alternatives to a specific community are inevitable, distributive fairness can be pursued by increasing benefits to that community (Schuitema & Bergstad, 2013). Financial compensations are by far the most frequently considered strategy in this respect. However, a comprehensive review of literature in the field demonstrates mixed evidence for the effectiveness of this strategy, with financial compensations increasing public support in some cases but not in other cases, and sometimes even reducing public support (Ter Mors, Terwel, & Daamen, 2012). When asked, only a minority of respondents stated that they would accept a nuclear waste repository in their immediate vicinity if financial compensation was provided (Sjöberg &

Drottz-Sjöberg, 2001). Also, offering (versus not offering) a monetary compensation did not increase citizens' willingness to vote in favour of a nuclear waste repository (Kunreuther, Easterling, Desvousges, & Slovic, 1990, cited by Ter Mors et al., 2012) and even reduced support for a nuclear waste repository implying that it was counterproductive (Frey, Oberholzer-Gee, & Eichenberger, 1996). Paying money to be able to implement energy alternatives that pose high *collective* risks can be seen as immoral by people (Elster, 1992 & Gerrard, 1994, cited by Ter Mors et al., 2012)[f]. Some responses, for example "I am not for sale" (Sjöberg & Drottz-Sjöberg, 2001, p. 90), suggest that people may feel insulted or suspect bribery attempts (see Böhm & Tanner, 2013; De Groot & Steg, 2011; Ter Mors et al., 2012). In such cases, providing collective goods rather than personal monetary incentives may be more adequate and less likely to evoke resistance (see Mansfield, Van Houtven, & Huber, 2002; Ter Mors et al., 2012). Indeed, in-kind measures like improving and establishing public services, were seen as more acceptable by people than direct monetary payments for siting facilities associated with collective costs, among which a nuclear waste repository (Jenkins-Smith & Kunreuther, 2001). In the same study, implementing strict safety measures (e.g. regular inspections of whether a facility meets regulations) turned out to be a more effective strategy for increasing acceptability of nuclear waste repository than offering financial compensations (Jenkins-Smith & Kunreuther, 2001). Possibly, financial compensations are more attractive to people when energy alternatives are seen as imposing individual rather than collective costs, like in case of renewable energy sources. Indeed, a study on acceptability of electrical generating

[f] A related argument is that primarily the size of perceived costs influences the effectiveness of compensation strategies, with these strategies being more effective when the perceived costs are low and less effective when the perceived costs are high (see Ter Mors at al., 2012). We assume that the type of costs plays a more important role. Specifically, perceived high individual costs can potentially be offset by a larger financial compensation, whereas that is unlikely for perceived (high) collective costs. However, in order to test this assumption, experimental studies are needed that would measure how public acceptability changes as a function of systematic differences in the size and type of perceived costs, and the size of financial compensation.

windmills in the mountains of North Carolina (the US) found that people's willingness to accept wind technology increased as a function of the proposed higher reductions in their energy bills (Groothuis, Groothuis, & Whitehead, 2007). Interestingly, individuals willing to participate in a Green energy programme required lower compensation for accepting wind technology, whereas individuals who retired to the mountains and/or had ancestors in the region required higher compensation (Groothuis et al., 2007). Next, in a study on a wind farm project in South Wales (the UK), many believed that wind farms should not even be developed unless they are owned by a local community (Devine-Wright, 2005a). A review of other studies revealed that ownership of wind energy (e.g. having shares in wind turbines, being a member of a wind co-operative) results in higher acceptability of this energy alternative (Devine-Wright, 2005b). While these findings could suggest that potential financial benefits from renewable energy increase acceptability via perceived distributive fairness, this hypothesis was not explicitly tested in the above studies. In fact, having shares in energy developments could (also) operate via perceived procedural fairness, as people may feel more involved and hence see the decision making process as fair. We discuss the effects of fair procedures on acceptability below.

4.3.3.3. Fair procedures

The extent to which implementation of energy alternatives entails qualities of fair procedures, such as information provision and transparency, opportunities for participation (sometimes referred to as "voice"), and impartial and respecting position of authorities, may influence perceived procedural fairness and hence acceptability (Schuitema & Bergstad, 2013; Tyler, 2000). Building on the findings on acceptability of waste infrastructure, Wolsink (2007) argued that for a successful implementation of renewable energy technology (in this case, wind energy), it is important to follow collaborative rather than hierarchical top-down decision making procedures. Similarly, based on the insights

from several local renewable energy projects, Walker and Devine-Wright (2008) concluded that the more involved people were in project development, the more support they expressed for a specific project and for renewable energy in general. Interestingly, an experimental study tested the effects of fair procedures on acceptability of decisions regarding CCS (Terwel, Harinck, Ellemers, & Daamen, 2010). People were more likely to accept decisions from political authority when they learned that environmental NGOs and industrial organisations were involved in the decision making process, than when they learned that none, or only one, of these parties were involved in the decision making (Terwel et al., 2010). The positive effects of fair procedures on acceptability were moderated by increased trust in decision makers, and particularly people who had some (versus no) knowledge about CCS desired public voice in decision making and demonstrated strongest effects of fair procedures (i.e. involving public representatives in decision making) on acceptability and trust (Terwel et al., 2010). More (experimental) studies are needed to systematically test the effects of various elements of decision making procedures on perceived procedural fairness and acceptability of energy alternatives.

In this section, we focused on the characteristics of energy alternatives that influence acceptability of these alternatives. We will now introduce another type of factors that have been argued to shape evaluations of energy alternatives, namely psychological factors.

4.4. Psychological factors shaping evaluations of energy alternatives

Even given the same characteristics of energy alternatives, people differ in how they evaluate these characteristics and, eventually, the energy alternatives. For example, there is a long tradition of divided public opinion on nuclear energy with, at some times, the supporters and opponents representing almost equal shares of the population (Butler et al.,

2011). While supporters of nuclear energy advocate its contribution to reduced greenhouse gases, opponents, on the other hand, see it as highly risky rather than beneficial for the environment (De Groot & Steg, 2010; De Groot et al., 2012). Disagreement also exists regarding various costs and benefits (i.e. collective and individual) of other energy alternatives, such as recently widely debated shale oil and gas (Clarke et al., 2013; Editorial: Fracking fracas, 2013). In general, people tend to see energy alternatives in an overly positive or a negative light. That is, they either ascribe high benefits and low costs or, on the contrary, low benefits and high cost to an energy alternative (Alhakami & Slovic, 1994; De Groot et al., 2012; Slovic, Finucane, Peters, & MacGregor, 2007). Such patterns are difficult to explain if only focusing on the characteristics of energy alternatives, as none of current energy alternatives is likely to have only costs or benefits, but rather a mixture of both. People's overly positive or negative evaluations have mostly been attributed to a positive or negative feeling about the evaluation object (Alhakami & Slovic, 1994; Poortinga & Pidgeon, 2005). But the question remains what gives roots to such a feeling. The goal-based approach may shed some light on this question. We argue that people evaluate energy alternatives based on the implications of these alternatives for their prominent goals, which are determined by their values. An interesting question is how far reaching the effects of values are. Do values make energy alternatives appear in an overly positive or negative light, including various aspects of these alternatives? To answer this question and to see whether there is support for our goal-based reasoning, we will review studies on the effects of values on evaluations of energy alternatives.

Before introducing values, we will review two other psychological factors that have been argued to shape evaluations of energy alternatives, namely *place-attachment and place-identity* and *trust*. These factors are situation-specific and may vary depending on, among others, the location where energy alternatives are implemented, the type of energy

alternatives, and the actors involved with energy alternatives. These factors thus operate at a different level than values, which can be conceptualized as chronically activated overarching goals and are expected to guide evaluations of various energy alternatives across many situations. As such, values could influence the workings of place-attachment and place-identity and trust when shaping evaluations of energy alternatives, as we will explain later.

4.4.1. Place-attachment and place-identity

Place-attachment and place-identity have been introduced as important psychological factors to explain people's evaluations of energy alternatives in their close environment, and hence as an alternative to the over-simplified NIMBY approach (Devine-Wright, 2005b, 2009; 2011; Devine-Wright & Howes, 2009). Place-attachment refers to one's emotional bonds with the local area, whereas place-identity reflects the extent to which physical and symbolic aspects of the place contribute to one's sense of self or identity (see Devine-Wright, 2005b; 2009; Vorkinn & Riesse, 2001 for conceptualization of these factors in the energy domain and the references therein). Some energy alternatives may be seen as disrupting place-attachment or threatening place-identity, thus reducing acceptability of these alternatives (Devine-Wright, 2009). Indeed, a Norwegian study revealed that the more people felt emotionally attached to the local natural areas (potentially) affected by a hydropower project, the stronger were their negative attitudes towards this project (Vorkinn & Riese, 2001). Notably, however, energy alternatives should not necessarily be interpreted as disturbing or threatening the local area, and thus the effects of place-attachment and place-identity on acceptability will not always be negative (Devine-Wright, 2005b; Devine-Wright & Howes, 2010). For example, a study in the UK revealed negative (modest) effects of place-attachment on acceptability of a large offshore wind farm, but only in a town where people perceived the wind farm as disrupting the

(salient) natural and restorative identity of the locality, while no such consistent negative effects were found in a town where people saw the place as being "run down" and perceived the wind farm less as a threat and, to some extent, even as an opportunity (Devine-Wright & Howes, 2009). A study comparing acceptability of an already built tidal energy convertor across two neighbouring villages in Ireland revealed that place-attachment resulted in less negative emotions towards the convertor in both villages and even resulted in more positive emotions in one village, where, according to the author, the convertor might have been perceived as enhancing the local area (Devine-Wright, 2011). Even participants who were generally against onshore wind farms admitted that in certain areas wind turbines may enhance, or at least not hamper, the "character" of the area (Butler et al., 2013). It has been proposed that the extent to which citizens see energy developments as threatening the locality depends on their trust in involved actors. In the above study in the UK the negative effects of place-attachment on acceptability of the wind farm were particularly pronounced for people who trusted the opposition group and did not trust the developer (Devine-Wright & Howes, 2009); we elaborate on trust in the next section. Later, we will argue that the situational influences of both trust and place-attachment and place-identity on evaluations of energy alternatives may depend on people's strongly chronically activated overarching goals, that is, their important values.

4.4.2. Trust

Development, production, distribution, and use of different energy alternatives are complex matters that can only be fully grasped by people with specific knowledge and expertise. This means that the public need to rely on other parties (e.g. energy companies, national and local governments, interest groups, knowledge institutes) when evaluating energy alternatives and their costs and benefits. Hence, the extent to which people trust these parties is an important factor for acceptability (see Huijts et al., 2012). In the literature,

trust has been defined as "a psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behavior of another" (Rousseau, Sitkin, Burt, & Camerer, 1998, p. 395). Trust is partly a personal predisposition but is also defined by the context (e.g. which parties are involved with energy alternatives and how they perform).

It has been argued that trust influences the perceived costs and benefits of energy alternatives, which, in turn, shapes acceptability of these alternatives (Siegrist, 1999; 2000). More trust in regulators was linked to lower perceived risks and, consequently, to higher acceptability of nuclear power (Whitfield, Rosa, Dan, & Dietz, 2009) and a radioactive waste repository (Flynn, Burns, Mertz, & Slovic, 1992). Trust was found to be particularly influential when people knew little about a (potential) hazard, and hence used trust as a heuristic for their evaluations (Siegrist & Cvetkovich, 2000). For example, nuclear power and hydroelectric power scored relatively low on self-rated knowledge and for both of them people with higher trust in responsible parties believed that these energy alternatives were associated with lower risks and higher benefits, whereas for other activities and technologies that were more familiar to people (e.g. home appliances, bicycles), no (strong) relationship between trust and the perceived costs and benefits were found (Siegrist & Cvetkovich, 2000). Trust also shaped the perceived costs and benefits of a new hydrogen system in transport (Montijn-Dorgelo & Midden, 2008), as well as the perceived costs and benefits and acceptability of a relatively unfamiliar CO_2 storage technology (Midden & Huijts, 2009). More specifically, trust induced affect towards a given technology, which, in turn, affected the perceived costs and benefits (Montijn-Dorgelo & Midden, 2008) and, given an energy alternative in one's immediate vicinity, directly affected acceptability ratings (Midden & Huijts, 2009). This suggests that trust could potentially make people develop an overall positive or a negative feeling about an

energy alternative, which will colour their evaluations, including the perceived costs and benefits. Interestingly, in a study on acceptability of energy alternatives in Chile, trust in responsible parties influenced the perceived costs and benefits and, consequently, acceptability of fossil fuels, hydro-energy, and nuclear energy, whereas trust was not related to the perceived costs and benefits or acceptability of renewable energy alternatives, such as solar, tidal, and wind energy (Bronfman et al., 2012). The authors suggested that trust in regulators is particularly important for controversial energy alternatives such as nuclear power, as people need to trust someone in mitigating noxious consequences. Producing energy from renewable sources, on the other hand, is not perceived as posing such severe threats and hence trust in regulators may become less relevant for evaluations of its risks and benefits and acceptability ratings (Bronfman et al., 2012). Yet, Sjöberg (2001) argued that trust in regulators can only play a modest role in shaping perceived risks of controversial technologies such as nuclear power, because people consider these risks as "unknown" and do not expect even experts to be able to exactly know the risks and to cope with them. Importantly, most studies on the relationship between trust and evaluations of energy alternatives are correlational, and hence do not allow to pin down the cause and the consequence in this relationship. For example, trust could indeed shape people's evaluations of energy alternatives, but, alternatively, people could adjust their trust judgements of responsible parties based on how beneficial or costly and how acceptable they find a specific energy alternative (see Eiser, Miles, & Frewer, 2002; Poortinga & Pidgeon, 2005). Experimental studies are needed to assess the extent to which different levels of trust (as manipulated by the experimenter) can influence evaluations of energy alternatives. These studies are rare, with a few exceptions discussed below.

It has been argued that people base their trust judgements on the competencies (i.e. experience and expertise) of the involved parties as well as on their integrity (i.e. honesty, openness, and concern for public interests; Earle & Siegrist, 2006; Terwel, Harinck, Ellemers, & Daamen, 2009a). Indeed, providing positive (versus negative) information about competence and integrity of parties involved in CCS development resulted in higher perceived trust in these parties (Terwel et al., 2009a). Interestingly, however, people's perceived costs and benefits and acceptability of CCS were only affected by the views of a certain party towards CCS (in favour or against) in the condition with positive (but not negative) competence-related information and in the condition with negative (but not positive) integrity-related information (Terwel et al., 2009a). These results thus suggest that the valence of information about involved parties can influence trust in these parties, whereas it depends on the type of information (competence- or integrity-related) whether people will rely on the position of these parties towards energy alternatives for their own evaluations of these alternatives.

It was found that information about values of involved parties influence trust in these parties, including social trust (i.e. trust in integrity) as well as confidence (i.e. trust in competence), whereas information about their performance could only, if even, influence confidence (Earle & Siegrist, 2006). Interestingly, people tend to put more trust in involved parties and the related technology (e.g. nuclear energy) if they see these parties as endorsing values similar to their own (Siegrist, Cvetkovich, & Roth, 2000). A study on acceptability of CO_2 storage found that when people perceived themselves and professional parties as sharing similar goals and values, they expected these parties to not only have good intentions but also sufficient skills and competencies to pursue these intentions (Huijts et al., 2007). These findings suggest that individual values play an important role in trust judgements. We propose that values could serve as a third factor that

influences both trust and evaluations of energy alternatives. Specifically, people may refer to their own values when coming up with trust judgements for responsible parties. Also, values may influence how people evaluate energy alternatives, which can then affect their trust judgements. We elaborate on the role of values in the next section.

4.4.3. Individual values

Values are overarching goals or ideals that define what is important to people and what consequences they strive for in their lives in general (Rokeach, 1973; Schwartz, 1992). Values guide a wide range of specific attitudes, beliefs, preferences, and behaviours (Maio, 2010; Rohan, 2000; Schultz, 2001; Steg, De Groot, Dreijerink, Abrahamse, & Siero, 2011), and have been proposed to play an important role in evaluations of energy alternatives (Bidwell, 2013; Butler et al., 2013; De Groot & Steg, 2011; De Groot et al., 2012; Parkhill et al., 2013; Whitfield et al., 2009). However, although values have been conceptualised as goals, it has not been clear how the goal qualities of values influence their effects on evaluations of energy alternatives. We argue that values are chronically activated overarching goals and can therefore determine which specific sub-goals are most prominent to people in a given situation (see Lindenberg & Steg, 2007). The different collective (e.g. environmental impact) and individual (e.g. price) costs and benefits of energy alternatives fulfil different sub-goals (e.g. to protect the environment, to save money). Therefore, people may evaluate energy alternatives differently, depending on the implications of these alternatives for their value-based goals.

In the environmental domain, where collective and individual costs and benefits are mixed and often in conflict (Abrahamse et al., 2005), a distinction between self-transcendence and self-enhancement values has been shown to be particularly relevant for explaining individual evaluations (De Groot & Steg, 2008; Dietz, Fitzgerald, & Shwom,

2005; Nordlund & Garvill, 2002; Steg & De Groot, 2012; Stern, 2000; Stern, Dietz, & Guagnano, 1998). Self-transcendence values refer to primarily considering collective outcomes, with two main types of these values being distinguished in the environmental domain: altruistic values, focusing on the well-being of other people and society, and biospheric values, focusing on environmental quality. Self-enhancement values, on the other hand, drive one's attention to individual costs and benefits. In the environmental domain, self-enhancement values encompass egoistic values, focusing on safeguarding and promoting one's personal resources, such as wealth and status, and hedonic values, focusing on improving the way one feels, such as improving comfort and pleasure (Steg, Perlaviciute, Van der Werff, & Lurvink, in press).

Based on the goal-based approach, we argue that self-transcendence and self-enhancement values determine which specific goals are most prominent for people when evaluating energy alternatives, for example a goal to protect the environment or a goal to save money. Accordingly, people may attend to costs and benefits of energy alternatives that have implications for their prominent goals, and base their evaluations on these particular costs and benefits. Specifically, the stronger their altruistic and/or biospheric values, the more likely people are to consider collective consequences of energy alternatives and to favour alternatives with high perceived collective benefits and low perceived collective costs. In contrast, the stronger their egoistic and/or hedonic values, the more likely people are to consider individual consequences of energy alternatives and to favour energy alternatives with high perceived individual benefits and low perceived costs. There is indeed support for this goal-based reasoning. Specifically, it has been found that the more people value the environment and the well-being of others, the less support they express for nuclear power (Corner et al., 2011; De Groot et al., 2012; Whitfield et al., 2009), whereas more support for this energy alternative stems from egoistic values (De

Groot et al., 2012) and traditional values (e.g. security and discipline; Whitfield et al., 2009). In another study, altruistic and biospheric values bolstered, whereas traditional values reduced, acceptability of wind energy (Bidwell, 2013).

Further, although indirect, support for the goal-based reasoning comes from studies on environmental concern. Self-transcendence values were found to give roots to environmental concern, defined as the extent to which one is aware of environmental problems, believes that these problems are caused by human behaviour, and takes responsibility for tackling these problems (Dietz, Fitzgerald, & Shwom, 2005; Dunlap, Van Liere, Mertig, & Jones, 2000; Stern, 2000). In turn, higher concern with the environment resulted in more favourable attitudes towards renewable energy (Arkesteijn & Oerlemans, 2005; Bang et al., 2000; Spence et al., 2010) and less favourable attitudes towards nuclear power (Corner et al., 2011; Spence et al., 2010) and CCS (Palmgren et al., 2004). When asked which energy-related areas the (Swedish) government should finance most, respondents with high environmental concern prioritized renewable energy sources and removal of CO_2 from the atmosphere, whereas respondents with low environmental concern prioritized nuclear power and nuclear waste disposal (Von Borgstede, Andersson, & Johnsson, 2013). Thus, (self-transcendence) values may influence acceptability via environmental concern. Yet, it is important to conceptually differentiate values and environmental concern (see Steg & De Groot, 2012). Values are chronically activated overarching goals and, contrary to environmental concern, encompass not only environmental goals but also altruistic, hedonic, and egoistic goals. Values were found to be better predictors of pro-environmental norms and intentions than environmental concern (Steg et al., 2011).

So, there is some initial support for the goal-based reasoning. Values were found to guide acceptability of energy alternatives, based on the implications of these alternatives

for people's prominent goals. But how far reaching are the effects of values? Can values make energy alternatives appear in an overly positive or a negative light, reflected in various aspects of these alternatives? Evidence suggests that they can. As explained above, trust might colour people's perceived costs and benefits of energy alternatives, while trust itself can be influenced by values. Specifically, people trust parties that they believe share similar values as their own (Huijts et al., 2007; Siegrist et al., 2000). However, the full chain of relationship between values, trust, perceived costs and benefits, and acceptability needs to be tested.

There is also evidence to suggest that values can directly influence the perceived costs and benefits of energy alternatives. For example, stronger biospheric values were found to only correlate with the perceived risks but not with the perceived benefits of nuclear energy, whereas stronger egoistic values correlated only with the perceived benefits but not with the perceived risks of nuclear energy (De Groot et al., 2012). Interestingly, the widely promoted potential of nuclear energy to reduce CO_2 emissions was least considered as likely by people with strong biospheric values, for whom this aspect should be particularly important, whereas it was most considered as likely by people with strong egoistic values, for whom this aspect should be somewhat less important (De Groot et al., 2012). Next, altruistic values predicted a belief that wind farms have positive economic effects for communities, whereas egoistic values, typically associated with economic interests, did not influence this belief, and traditional values diminished this belief (Bidwell, 2013). Interestingly, the author put forward a possibility that "positive attitudes towards the development of renewables biases people with altruistic values to expect wind farms to have economic benefits" (Bidwell, 2013, p. 197). Thus, people may see energy alternatives that support their values in an overly positive light, with high benefits and low costs, whereas they may see energy alternatives that threaten their values

in an overly negative light, with low benefits and high costs. Even evaluations of costs and benefits that are not particularly important to people on the basis of their values may come under the influence of the value-based judgements of their likelihood[g]. This assumption, however, builds on preliminary evidence and calls for further investigation.

In the section on fairness-related characteristics of energy alternatives, and specifically on compensation strategies, we argued and provided some evidence that people may perceive trade-offs between collective costs and individual benefits (i.e. monetary incentives) as immoral, unfair, and unacceptable. Similarly, it was found that feelings of moral obligation guided intention to act against nuclear energy, which is associated with high collective costs (De Groot & Steg, 2010). In another study, feelings of moral obligation roughly equally predicted intention to act against and in favour of hydrogen refuelling stations, which was, according to the authors, due to hydrogen fuel being associated with mixed collective costs and benefits (Huijts et al., 2013). We propose that values play an important role in such moral considerations and, potentially, perceptions of fairness. Indeed, values (especially self-transcendence values) have been linked to perceived moral obligation to engage in (or to refrain from) environmental actions (Stern, 2000). Notably, it has been proposed that people engage in either deontological or consequential reasoning when evaluating objects and events (Böhm & Pfister, 2000; Böhm & Tanner, 2013). Deontological reasoning implies that people focus primarily on moral rightness or wrongness of an action per se, irrespective of eventual costs and benefits, whereas consequential reasoning means that people focus particularly on maximising benefits and minimising costs. Linking this to values, it seems plausible that people with strong altruistic and/or biospheric values, who find collective costs very important, are most likely to judge any trade-off between collective costs and individual

[g] Thus, some evidence in literature points to a halo effect of the goal-based valence. We explicitly study this effect in Chapters 3 and 5 of this PhD thesis.

benefits as unfair, and hence oppose an energy alternative all together. People with strong egoistic and/or hedonic values, on the other hand, may adopt a more consequential reasoning and hence accept the trade-off between collective costs and individual benefits as long as they consider individual benefits big enough to compensate for the costs. This assumption requires empirical investigation.

We argued that the situational influence of trust on evaluations of energy alternatives may depend on values, since trust can be rooted in people's values. Additionally, we propose that the situational influence of place-attachment and place-identity on evaluations of energy alternatives may also be sensitive to values. Specifically, people may be more likely to perceive energy alternatives as threatening their locality if these alternatives threaten their important values (see Gardner & Stern, 2002). In this way, values may interact with place-attachment and place-identity when shaping evaluations of energy alternatives. Specifically, place-attachment and place-identity may have strong negative effects on evaluations of energy alternatives in a specific place if these alternatives threaten important values of the local people. In contrast, place-attachment and place-identity may have positive effects on evaluations if energy alternatives are seen as supporting important values of the local people. These assumptions need to be empirically tested.

4.5. Research agenda

Based on the extensive review of theoretical and empirical studies, we identified two key factors shaping evaluations of energy alternatives, namely *characteristics of energy alternatives* and *psychological factors*, particularly values (see Figure 1). Importantly, we found support for the proposed goal-based explanation of evaluations of energy alternatives. Specifically, people evaluate energy alternatives based on the implications of

these alternatives for their prominent goals, which, in turn, are rooted in their values. In this section, we develop a research agenda for future exploration of evaluations of energy alternatives, based on the knowledge developed and on the goal-based approach. Notably, Figure 2 shows an extended conceptual framework; the dashed lines in this Figure indicate new themes to be addressed in future research.

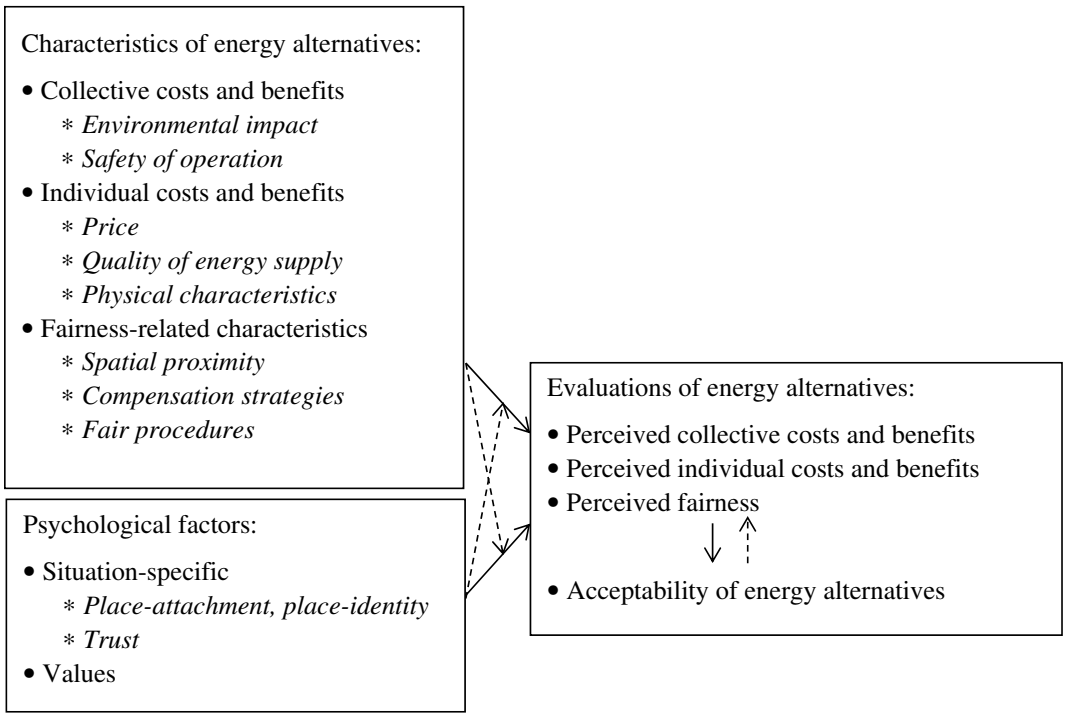

Figure 2. Extended conceptual framework that explains evaluations of energy alternatives. The solid lines reflect the relationships that have been addressed in literature so far, whereas the dashed lines reflect additional relationships to be addressed in future research

A great amount of academic work describes how people perceive costs and benefits of various energy alternatives and how these perceptions relate to their acceptability ratings. Our review shows that perceived collective and individual costs and benefits and perceived fairness play a role in acceptability ratings, and various energy alternatives were found to score differently on these aspects. Having reached this knowledge, it is now feasible and crucial to move from mainly describing *how* people evaluate energy alternatives to explaining *why* they evaluate these alternatives in the way they do. The goal-based approach posits that people evaluate energy alternatives based on the implications of these alternatives for their prominent goals. The characteristics of energy alternatives define the costs and benefits, which enable people to fulfil different goals, whereas values determine which goals are most prominent to people when evaluating energy alternatives. Prior research provided important insights into the role of characteristics of energy alternatives and psychological factors, particularly values, and already raised some interesting questions for future research, as discussed earlier in this article. Here, we describe some major guidelines for further in-depth analysis of the influence of these factors on evaluations of energy alternatives.

An important question concerns the relationship between the characteristics of energy alternatives and people's evaluations of these alternatives. Only a limited number of characteristics of energy alternatives have been addressed in the literature so far, while other important characteristics could influence evaluations. It is important to specify how different characteristics affect evaluations, each one separately as well as in combination, before deciding which characteristics are most important and should be addressed in intervention strategies. So far, studies have usually compared energy alternatives that differ on many characteristics (e.g. comparing fossil fuels, nuclear energy, and renewable energy sources), making it difficult to conclude which characteristics of these alternatives and to

what extent account for observed variance in evaluations. Several studies compared evaluations of the same energy alternative before and after certain characteristics changed, as in case of nuclear accidents. However, even these studies cannot rule out the possibility that other factors could have guided the observed results, for instance changes in (nuclear) energy policy. We propose that next to studying real life energy alternatives that differ on many characteristics, it is important to conduct experimental studies where different characteristics can be manipulated while keeping other factors constant. This enables us to examine whether evaluations change when certain characteristics change, as well as how these changes depend on other, systematically manipulated, factors. Importantly, interventions aimed at changing the characteristics of energy alternatives (e.g. reducing prices) could be first tested in controlled experiments to assess the effects of these interventions on evaluations, and to compare these effects with the effects of other possible interventions (e.g. improving safety measures) before implementing them on a large scale in practice.

Another research question revolves around the relationship between the perceived costs and benefits of energy alternatives and acceptability of these alternatives, which so far has been mostly studied in one direction, namely from the perceived costs and benefits to acceptability (see the solid line in Figure 2). It is typically assumed that the way people perceive costs and benefits of energy alternatives guide their acceptability ratings. However, based on the goal-based approach, we suggest that the effects could potentially go in the direction from acceptability to the perceived costs and benefits (see the dashed line in Figure 2). Specifically, in order to form their acceptability ratings, people attend to the costs and benefits that are linked to a strongly chronically activated overarching goal (value). Hence, here perceived costs and benefits guide acceptability. Once formed, however, these acceptability ratings may colour evaluations of other costs and benefits that

are less important to people in the light of their strongly chronically activated overarching goals (values). The latter implies that acceptability guides perceived costs and benefits in support of one's value-based position[h]. Initial support for this reasoning comes from studies showing that values influence acceptability of energy alternatives and the perceived costs and benefits that may not necessarily be important in the light of one's values (Bidwell, 2013; De Groot et al., 2012). Future studies need to distinguish between evaluations of costs and benefits that are important for one's values and hence may "truly" guide acceptability, and evaluations of costs and benefits that are not important for one's values and may be coloured by value-based acceptability ratings.

Our review clearly reveals that characteristics of energy alternatives and psychological factors, particularly values, are usually studied separately and hardly ever studied in combination when explaining evaluations of energy alternatives (see the solid lines in Figure 2). The goal-based approach posits that people may evaluate the same energy alternatives, including their costs and benefits, differently, depending on their value-based prominent goals. Therefore, we propose that evaluations of energy alternatives should be addressed in future research as a product of the interaction between the characteristics of energy alternatives and psychological factors, particularly values (see the dashed lines in Figure 2). Important questions are, for example, how do psychological factors, particularly values, predict evaluations of energy alternatives with different characteristics? To what extent can psychological factors, particularly values, exert their influence on evaluations when severe contextual barriers for acceptability are present (e.g. unaffordable price, hazardous pollution levels)? To what extent are evaluations of energy alternatives influenced by the actual characteristics of these alternatives, relative to how people perceive these characteristics on the basis of their values? Answering these

[h] We refer here to a halo effect of the goal-based valence, which we explicitly test in Chapters 3 and 5 of this PhD thesis.

questions can help assess what type of interventions (i.e. targeting the characteristics of energy alternatives or psychological factors, particularly values) are most effective for addressing evaluations of energy alternatives (see the section on policy implications).

Besides raising new research questions and adding additional relationships to the conceptual framework (see the dashed lines in Figure 2), it is also important to explore the parts of the framework that have already been studied but could yet be explored with a systematic theory-driven approach and multi-method empirical testing. This could include, for instance, studying the effects of characteristics of energy alternatives and psychological factors that so far received no or little attention. Interaction effects of multiple characteristics of energy alternatives or psychological factors could be investigated, like the interplay between values, on the one hand, and place-attachment and place-identity and trust, on the other hand. Next, the development of psychological factors needs (further) investigation, particularly whether and how these factors can change. For example, values are considered to be a relatively stable personal predisposition, yet the relative importance of values might change, for instance due to new experiences in life (Bardi & Goodwin, 2011; Lönnqvist, Jasinskaja-Lahti, & Verkasalo, 2011). Value change, however, remains a highly underresearched topic, calling for more (longitudinal) studies. Next, it is important to study whether the factors depicted in the conceptual framework and the goal-based reasoning apply when explaining evaluations of various energy alternatives, including different types of renewable energy sources and technology. A comprehensive series of studies is needed to test the hypotheses derived from specific parts of the framework and clarify which relationships in the framework are valid under which conditions.

To sum up, the theoretical and empirical research so far sketches a conceptual framework to explain evaluations of energy alternatives and provides some initial evidence for the goal-based reasoning. However, future research is needed to test the goal-based

reasoning and further develop the conceptual framework that explains evaluations of energy alternatives. An important task for future research is to integrate the existing knowledge into comprehensive theories explaining *why* people hold certain evaluations of energy alternatives, and to systematically test these theories by adopting a range of different research methods.

4.6. Policy implications

The existing knowledge about evaluations of energy alternatives offers important implications for policy making, particularly in pursuit of sustainable energy transitions. Below, we first describe how not taking the interaction between characteristics of energy alternatives and psychological factors, particularly values, into account might to lead to ineffective intervention strategies. Next, we provide suggestions for how to target characteristics of energy alternatives and psychological factors, particularly values, in interventions aiming to secure public support for sustainable energy transitions.

Mutual influences of the characteristics of energy alternatives and psychological factors, particularly values, are rarely considered in practice. Instead, the focus lies on a limited number of factors that are presumed to be dominant in evaluations of energy alternatives. For example, practitioners and policy makers typically assume that financial arguments are most important to people, and hence they use exclusively these arguments to promote energy alternatives (e.g. emphasizing monetary pay-offs in the long run as the key reason to adopt renewable energy). This review demonstrates, however, that people may accept energy alternatives even if that implies higher costs to them, provided that the energy alternatives have desired elements, for instance low CO_2 emissions. Thus, people may find environmental consequences of energy alternatives important, and financial arguments may not always by a silver bullet for promoting sustainable energy transitions.

In fact, there is evidence to suggest that environmental arguments may outperform financial arguments in encouraging sustainable choices (Bolderdijk, Steg, Geller, Lehman, & Postmes, 2012; Thøgersen, 2013).

It is often assumed in practice that people will change their evaluations if they receive more information about energy alternatives. Yet, the findings reported here suggest that information strategies should be considered with care as they may not always yield the intended effects on evaluations. Although information provision can extend people's knowledge or correct their misperceptions (if present) of certain costs and benefits of energy alternatives, it depends on the characteristics of energy alternatives and psychological factors, particularly values, how this knowledge will eventually influence people's evaluations. For example, other characteristics of energy alternatives than those addressed in information campaigns may be more important to people and drive evaluations irrespective of the given information. In that case, information about the key characteristics might be more relevant or, in some cases, changing certain characteristics might be necessary to sustain acceptability of energy alternatives (McAllister et al., 2010; Thøgersen, 2005). Besides, trust in information sources is important. People will only integrate information in their evaluations if they trust the information source, whereas they are likely to disregard information coming from the source that they do not trust. Next, the effects of information strategies are likely to depend on people's values, which define how important certain information is to people. Information that does not resonate with one's important values will most likely not motivate people to change their evaluations (Bolderdijk, Gorsira, Keizer, & Steg, in press). Thus, the effectiveness of information strategies could potentially be improved by tailoring information to people's important values (Abrahamse, Steg, Vlek, & Rothengatter, 2007), or by changing the influence of values on evaluations, as we will explain later in this section. Interestingly, it has been

found that people particularly attend to information that supports their prior judgements, whereas they disregard information that speaks against these judgements, a phenomenon known as motivated cognition (Kunda, 1999; Lord, Ross, & Lepper, 1979). Based on the goal-based approach, we argue that people may build their initial judgements of energy alternatives on the basis of their values and, consequently, evaluate information according to how well it "fits" their value-based judgements. For example, people with strong biospheric values may disregard the argument that nuclear energy has low CO_2 emissions and is therefore (relatively) sustainable if they have already judged nuclear energy unfavourably, for instance because of pollution in case of accidents (De Groot et al., 2012). It is therefore important to know which characteristics of energy alternatives "truly" guide people's evaluations and address particularly these characteristics in information campaigns.

One way to enhance positive evaluations of energy alternatives is by changing the actual costs and benefits of these alternatives. In pursuit of sustainable energy transitions, this would mean reducing the costs and increasing the benefits of sustainable energy alternatives and, in contrast, increasing the costs and reducing the benefits of non-sustainable energy alternatives. Examples include, among others, changes in safety measures, energy prices, and energy technology. Changing the characteristics of energy alternatives is particularly important when severe contextual barriers for acceptability exist (e.g. unaffordable energy price). Such barriers may overrule the influence of general psychological factors, particularly values, on evaluations of energy alternatives (Lindenberg & Steg, 2007; Steg et al., in press). For example, even people with strong biospheric values may not adopt sustainable energy alternatives if these alternatives imply much higher costs to them than non-sustainable alternatives. Indeed, the perceived moral obligation to use "green" energy was more predictive of the intention to use "green" energy

in the Netherlands, where the price difference between “green” and “non-green” energy is relatively small, whereas it was less predictive in other countries, where the price difference is considerably large (Keizer, Steg, & Van Zomeren, under review). Reducing the price difference could therefore increase the possibility that people who strongly endorse biospheric values and therefore feel morally obliged to adopt “green” energy will actually do so.

Changing the characteristics of energy alternatives might not always be possible or can be highly costly. Furthermore, this review and the goal-based approach clearly indicate that the way people perceive costs and benefits depends not only on the actual characteristics of energy alternatives but also on psychological factors, particularly values. Therefore, addressing psychological factors is an additional way to influence evaluations of energy alternatives. For example, an important condition for sustainable energy transitions is that people trust the involved parties and the proposed sustainable energy alternatives. However, recent findings indicate that people put relatively little trust in key actors in sustainable energy transitions, namely energy companies and the national (UK) government, as people do not think they are honest, open, and fair (Butler et al., 2013; Parkhill et al., 2013). How can these perceptions be changed in order to promote sustainable energy transitions? A strategy frequently used in practice is to try and show to people that the involved parties have enough knowledge, skills, and expertise to carry out their responsibilities. Literature suggests, however, that information about values of these parties affects trust more strongly than information about their skills and competencies (Earle & Siegrist, 2006; Siegrist et al., 2000). Low trust in energy companies and the government could be (partly) due to the fact that people see these parties as only interested in making profit and not taking people’s well-being and environmental quality into consideration. A relevant study on trust in parties involved in CCS technology found that

inferred organization-serving goals (e.g. make profit) accounted for relatively low trust in industrial organizations, whereas inferred public-serving goals (e.g. protect the environment) accounted for relatively high trust in NGOs among Dutch citizens (Terwel, Harinck, Ellemers, & Daamen, 2009b). Interestingly, the same study found that respondents considered it dishonest when an industrial organisation simply communicated public-serving goals, which instigated even less trust than when the organisation communicated organization-serving goals. Only when the organisation communicating public-serving goals also acknowledged its self-serving goals, trust could be preserved (Terwel et al., 2009b). Thus, it is essential that parties are honest and transparent about all their important values and goals. Possibly, acting upon societal values, rather than merely communicating these values, could help industry and governments to (re)gain public trust, for example by investing in community or environmental funds, establishing social facilities, listening to people's opinion and taking it into consideration in decision making (Terwel et al., 2009b). This proposition needs to be tested in future (experimental) studies.

Based on this review and the goal-based approach, we propose that, when there are no severe contextual barriers, evaluations of energy alternatives can be (further) influenced by targeting individual values. Biospheric values in particular can provide a strong basis for promoting sustainable energy transitions, as people with strong biospheric values may accept sustainable energy alternatives even if that implies costs to them personally. It is therefore surprising that the possibility of strengthening the influence of biospheric values on evaluations has been largely neglected in literature and in practice on sustainable energy transitions. Below, we suggest three main routes to increase the influence of biospheric values, which is expected to enhance the positive evaluations of sustainable energy alternatives (see Steg et al., in press).

One possible route is via strengthening biospheric values, since, as noted above, it seems that the relative strength of values can change in time. Strengthening biospheric values might require systematic long-term interventions, such as incorporating sustainability subjects in general education programmes. Possibly, acknowledging environmental problems and emphasizing the urge to combat them now might result in stronger biospheric values among future generations, which, in turn, will support future sustainable (energy) transitions.

Another (parallel) route is to enable people to act upon their biospheric values. This implies developing energy alternatives with relative high benefits and low costs for the environment and removing severe contextual barriers for acceptability of such alternatives. However, reducing the (individual) costs of energy alternatives might not always be possible. Furthermore, focusing particularly on costs might activate egoistic and hedonic values and increase their influence on people's evaluations. This might be counterproductive, as egoistic and hedonic values are not likely to provide a reliable basis for acceptability of sustainable energy alternatives. Specifically, if driven primarily by egoistic and hedonic goals, people will engage in sustainable energy transitions only if (or as long as) that is beneficial for them, whereas they will withdraw if (or as soon as) individual benefits decrease or individual costs increase.

The third (parallel) possibility is to activate biospheric values. People are more likely to act upon their (biospheric) values when these values are activated by cues in a situation (Maio, 2010; Verplanken & Holland, 2002). Various situational cues can activate values, for example providing reasons for values (Maio, Olson, Allen, & Bernard, 2001) or value-signalling behaviours of others (Keizer, Lindenberg, & Steg, 2008; 2013). Energy policies could also serve as cues activating or deactivating certain values. Focusing exclusively on egoistic arguments (e.g. profit, price) in policy making might activate

egoistic and hedonic values and strengthen their influence on evaluations of energy alternatives. To prevent that from happening (since egoistic and hedonic goals do not create a reliable basis for acceptability of sustainable energy transitions), egoistic arguments should not be the only or dominant ones when promoting sustainable energy alternatives. Instead, sustainable energy transitions should be linked to higher-order societal and environmental goals, in order to (further) strengthen the influence of biospheric values on evaluations.

To sum up, public support for sustainable energy transitions can be enhanced by changing the actual costs and benefits of energy alternatives and/or by addressing psychological factors, particularly values, that shape how these costs and benefits are perceived and evaluated. A particularly promising strategy in this respect is increasing the influence of biospheric values and the corresponding goals on evaluations of energy alternatives. This can be done by strengthening these values in a long term, enabling people to act upon these values, and activating these values when promoting sustainable energy alternatives. This can preserve public support for sustainable energy alternatives even if that implies costs to people.

7. Conclusions

We reviewed theoretical and empirical studies in order to identify the key predictors of evaluations of energy alternatives and to see whether there is support for the goal-based explanation of these evaluations. The current framework extends existing models of predictors of evaluations of energy alternatives, as it integrates both the characteristics of energy alternatives and psychological factors, particularly values. Across studies, we found evidence that people evaluate energy alternatives based on the implications of these alternatives for their prominent goals, which, in turn, are determined by their values. We

developed a research agenda and policy implications to illustrate how taking both the characteristics of energy alternatives and psychological factors into account, in the context of the goal-based approach, can help us understand evaluations of energy alternatives and develop effective strategies to enhance sustainable energy transitions.

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Chapter 5

THE INFLUENCE OF VALUES ON EVALUATIONS OF ENERGY ALTERNATIVES[a]

[a] This chapter is based on the manuscript submitted for publication: "The influence of values on evaluations of energy alternatives" by Goda Perlaviciute and Linda Steg. The chapter is written in a third person language to meet the journal requirements for submission.

Abstract

This paper studies people's evaluations of nuclear and renewable energy. Both are promoted as relatively sustainable, but elicit different evaluations in people. People generally associate (whether true or not) nuclear energy with disadvantages for the environment and advantages for consumers' resources, whereas they associate renewable energy with advantages for the environment and disadvantages for consumers' resources. But how do people evaluate energy alternatives with such mixed consequences? The authors take a goal-based approach and argue that people evaluate energy alternatives based on the implications of these alternatives for their prominent goals. Individual values, particularly biospheric (e.g. valuing nature and the environment) and egoistic (e.g. valuing wealth) values, may determine which goals are prominent to people when evaluating nuclear and renewable energy. The results from two studies on nuclear (Study 1) and renewable (Study 2) energy showed that values indeed influence evaluations of energy alternatives in three important ways, as expected based on the goal-based approach. First, the stronger their egoistic values, the more people rated individual consequences of energy alternatives as important, whereas the stronger their biospheric values, the more they rated environmental consequences of energy alternatives as important. Second, this translated into attitudes: the stronger their egoistic values, the more people favoured nuclear energy and the less they favoured renewable energy. Conversely, the stronger their biospheric values, the more people favoured renewable energy and the less they favoured nuclear energy. Third, people ascribed generally more positive consequences to the energy alternative that they favoured on the basis of their values, whereas they ascribed generally less positive consequences to the energy alternative that they disfavoured on the basis of their values. Some of these ascribed consequences were not particularly important to people given their values. This implies that people judge energy alternatives based on the

consequences for their prominent goals, whereas the valence if this goal-based judgement can cause a halo effect and colour evaluations of other consequences unrelated to one's prominent goals. The results were robust for both energy alternatives and were not affected by variations in the methods used, suggesting that value effects may generalize to evaluations of many different energy alternatives. Practical implications are provided.

Keywords: attitudes; evaluations; goals; nuclear energy; renewable energy; values.

5.1. Introduction

Due to environmental problems and exhaustion of natural resources, the use of fossil fuels needs to be restricted and eventually replaced by alternative energy sources. Two such alternatives have been widely considered so far: nuclear and renewable energy (Forsberg, 2008; Verbruggen, 2008). Interestingly, however, although both have been promoted as relatively environmentally friendly, nuclear and renewable energy are associated by people with rather different consequences for the environment and for consumers' resources. Surveys show that, despite being touted as a low-carbon energy alternative, nuclear energy is nevertheless perceived by people as having a relatively large negative environmental impact, larger than renewable energy (Culley, Carton, Weaver, Ogley-Oliver, & Street, 2011; Devine-Wright, 2003; Poortinga, Pidgeon, & Lorenzoni, 2006). Studies have demonstrated that people only "reluctantly" accept nuclear energy as a means to combat climate change, if they have concluded that there is no other solution in the foreseeable future (Bickerstaff, Lorenzoni, Pidgeon, Poortinga, & Simmons, 2008) or if nuclear energy is explicitly framed as a solution to tackle climate change (Corner, Venables, Spence, Poortinga, Demski, & Pidgeon, 2011; Pidgeon, Lorenzoni, & Poortinga, 2008). Interestingly, when such explicit framing included both advantages as well as disadvantages of using nuclear energy to combat climate change, it had virtually no positive effect on acceptability (Pidgeon et al., 2008). Across studies, there has been a clear preference for alternative energy sources to combat climate change, particularly the use of renewable energy sources (Bickerstaff et al., 2008; Corner et al., 2011; Pidgeon et al., 2008; Poortinga et al., 2006). People indeed perceive renewable energy as more environmentally friendly than nuclear energy (Devine-Wright, 2003; Culley et al., 2011; Poortinga et al., 2006) and see it as the most adequate option for sustainable energy transitions (Butler, Parkhill, & Pidgeon, 2013; Parkhill, Demski, Butler, Spence, &

Pidgeon, 2013). At the same time, however, renewable energy is often associated with disadvantages for consumers' resources. Specifically, people consider it to be relatively pricy (Arkesteijn & Oerlemans, 2005), they tend to perceive renewable energy technology as spoiling the scenery and noisy (Wolsink, 2000), and they are concerned that it might cause inconveniences in their daily energy use, say for cooking (Butler et al., 2013; Parkhill et al., 2013). In comparison, people often associate nuclear energy with cheap and reliable energy, employment, and economic growth (De Groot & Steg, 2010; De Groot, Steg, & Poortinga, 2012; Drottz-Sjöberg & Sjöberg, 1990; Venables, Pidgeon, Simmons, Henwood, & Parkhill, 2009).

To sum up, surveys reveal that nuclear energy is generally associated by people with disadvantages for the environment and advantages for consumers' resources, whereas renewable energy is generally associated with advantages for the environment and disadvantages for consumers' resources. These so-called environmental and individual consequences of energy alternatives enable people to fulfil various goals (e.g. a goal to protect the environment or to save money) and hence may influence people's evaluations of energy alternatives (see Lindenberg and Steg, 2007). But what factors define how important these different consequences are to people, and will this affect people's attitudes towards energy alternatives? Do these factors also influence the perception of consequences of energy alternatives? The goal-based approach posits that people evaluate energy alternatives based on the implications of these alternatives for their prominent goals. People's general values in life, which can be conceptualised as chronically activated overarching goals, determine which specific goals are prominent to people in a given situation (see Lindenberg & Steg, 2007 for a detailed explanation of the relationship between overarching goals and specific sub-goals in a situation). As such, values may affect how people appreciate specific consequences of many different objects and

behaviours, including energy alternatives. Indeed, general values have been found to guide people's evaluations of a range of behaviours and objects (Maio, 2010; Rohan, 2000; Schultz, 2001; Steg, De Groot, Dreijerink, Abrahamse, & Siero, 2011). This paper examines how values affect evaluations of two energy alternatives that have different implications for people's various goals, namely nuclear and renewable energy. More specifically, the paper aims to study how values affect three types of evaluations: I) the perceived importance of various (i.e. environmental and individual) consequences of energy alternatives, reflecting the extent to which people rate these consequences as important to them; II) attitudes towards energy alternatives, reflecting the extent to which people generally (dis)favour energy alternatives; and III) the perception of consequences of energy alternatives, reflecting how likely, people think, energy alternatives are to have various positive or negative consequences. If values indeed determine what goals are prominent to people when evaluating energy alternatives, they should influence all these three types of specific evaluations, as explained below.

*5.1.1. Values and the perceived importance of consequences of energy alternative*s

When explaining sustainable attitudes and behaviours, a distinction between self-transcendence values, which refer to primarily considering collective consequences, and self-enhancement values, which refer to primarily considering individual costs and benefits, has been shown to be important (De Groot & Steg, 2008; Dietz, Fitzgerald, & Shwom, 2005; Nordlund & Garvill, 2002; Steg & De Groot, 2012; Stern, 2000; Stern, Dietz, & Guagnano, 1998). Two main types of self-transcendence values have been distinguished, namely altruistic values, focusing on the well-being of other people and society (e.g. equality), and biospheric values, focusing on the quality of nature and the environment (e.g. unity with nature). Self-enhancement values encompass egoistic values, focusing on safeguarding and promoting one's personal resources (e.g. wealth), and

hedonic values, focusing on improving the way one feels (e.g. pleasure; Steg, Perlaviciute, Van der Werff, & Lurvink, in press).

Although values have been conceptualised as goals (Rokeach, 1973; Schwartz, 1992), it has not been studied how the goal qualities of values can influence the effects of values on evaluations. It is argued here that values are chronically activated overarching goals and therefore determine which specific sub-goals are prominent to people in a given situation (see Lindenberg & Steg, 2007, 2013). For example, a goal to protect the environment is more likely to be prominent for someone with strong biospheric values, whereas a goal to save money is more likely to be prominent for someone with strong egoistic values. It is expected that people attend particularly to the consequences of energy alternatives that have instrumental value for the pursuit of their prominent goals. If this assumption is correct, it should reflect in how much importance people ascribe to different consequences of energy alternatives. Specifically, when exposed to energy alternatives, people should evaluate the consequences of these alternatives that are congruent with their important values as particularly important (Hypothesis 1). Particularly biospheric and egoistic values are expected to guide the perceived importance of the environmental and individual consequences of nuclear and renewable energy. The stronger people's egoistic values, the more likely they are to rate individual consequences of energy alternatives as important, whereas the stronger their biospheric values, the more likely they are to rate environmental consequences of energy alternatives as important. Although it has been proposed in value theory that people particularly attend to information about aspects in their environments that have consequences for their important values (Nordlund & Garvill, 2002; Stern & Dietz, 1994; Steg, Bolderdijk, Keizer, & Perlaviciute, in press; Steg & De Groot, 2012; Stern, Kalof, Dietz, & Guagnano, 1995), this hypothesis has not been explicitly tested so far.

Alternatively, one could think that it depends on a specific energy alternative and its specific consequences how important these consequences are to people. That is, an alternate reasoning could be that people merely highlight the importance of the positive consequences of their favoured energy alternatives and the negative consequences of their disfavoured energy alternatives. If, however, values are indeed chronically activated overarching goals, people should consistently prioritize the same consequences that are congruent with their important values, irrespective of which energy alternative they are considering. Importance ratings of consequences of energy alternatives should therefore not be influenced by people's attitudes towards and the perceived consequences of a specific energy alternative.

To conclude, this paper seeks to test whether people prioritize consequences of energy alternatives that are congruent with their important values. Values are overarching goals and reflect what people find important in their lives in general, whereas the perceived importance of consequences is a specific construct, linked to a specific energy alternative, and thus the question remains whether the proposed relationship exists (cf. Eyal, Sagristano, Trope, Liberman, & Chaiken, 2009). To test this empirically, the present study examined the relationship between egoistic and biospheric values, on the one hand, and the perceived importance of environmental and individual consequences of nuclear and renewable energy, on the other hand. Finding the predicted value-importance relationship consistently across different energy alternatives would provide evidence that values indeed determine which goals are prominent to people in a given situation. This would indicate that values may guide the perceived importance of consequences of many different energy alternatives.

5.1.2. Values and attitudes towards energy alternatives

According to attitude theories, people build their attitudes by weighing costs and benefits that are important to them (see Ajzen, 2001). The goal-based approach posits that it depends on people's prominent goals which costs and benefits they find important, whereas their prominent goals are rooted in values. It is therefore hypothesised that values will guide attitudes towards energy alternatives, based on the consequences of these alternatives for one's value-based prominent goals (Hypothesis 2). Nuclear energy is generally seen as fulfilling the goals rooted in egoistic values (e.g. to save money) but not the goals rooted in biospheric values (e.g. to protect the environment). In contrast, renewable energy is seen as fulfilling the goals driven by biospheric values but not the goals driven by egoistic values. As a result, these energy alternatives should yield opposite patterns of the value-attitude relationship. That is, the stronger their egoistic values, the more likely people are to favour nuclear energy, whereas the less likely they are to favour renewable energy. Conversely, the stronger their biospheric values, the more likely people are to favour renewable energy, whereas the less likely they are to favour nuclear energy.

There is initial evidence to show that nuclear energy is indeed less favoured by people with strong (versus weak) biospheric values (Corner et al., 2011; De Groot et al., 2012; Whitfield, Rosa, Dan, & Dietz, 2009)[b], whereas it is more favoured by people with strong (versus weak) egoistic (De Groot et al., 2012) and traditional (e.g. security, discipline; Whitfield et al., 2009) values. Another study found that renewable energy (in this case, wind energy) was more favoured by people with strong (versus weak) biospheric and altruistic values, whereas it was less favoured by people with strong (versus weak)

[b] In some studies (e.g. Whitfield et al., 2009), biospheric values were not measured separately but included in a scale including altruistic values as well, which together reflect a concern with the welfare of other people and other species. Since biospheric and altruistic values are typically positively correlated and have similar effects on attitudes and evaluations (as long as these values are not in conflict; see Steg & De Groot, 2012), the effects of combined biospheric and altruistic values are interpreted and cited in this paper as the effects of biospheric values.

traditional values (Bidwell, 2013). The evidence, however, comes from studies using various value measures and typically focusing on a single energy alternative, which makes it difficult to systematically compare the effects of values on attitudes towards different energy alternatives. If attitudes towards energy alternatives are indeed rooted in values, one should be able to find that these values lead to different attitudes towards different energy alternatives, depending on the perceived consequences of these alternatives for people's value-based prominent goals. The current study seeks to capture, if present, such systematic differences in the value-attitude relationship. Accordingly, egoistic and biospheric values were consistently measured and linked to attitudes towards nuclear and renewable energy. Finding the predicted opposite relationship between values and attitudes for these two different energy alternatives would support the assumption that people evaluate energy alternatives based on the implications of these alternatives for their value-based prominent goals. This would indicate that the effects of values may generalize to attitudes towards many different energy alternatives, but yield different outcomes depending on the perceived consequences of these alternatives for people's value-based goals.

5.1.3. Values and the perception of consequences of energy alternatives

People differ in the extent to which they perceive energy alternatives as having various positive and negative consequences. Indeed, the environmental and individual consequences of nuclear and renewable energy have been widely debated, with sometimes the very same consequences being framed either positively or negatively by, respectively, supporters and opponents (Teräväinen, Lehtonen, & Martiskained, 2011). For example, while supporters of nuclear energy advocate its contribution to reduced CO_2 emissions, opponents see it as highly risky rather than beneficial to the environment (De Groot & Steg, 2010; De Groot et al., 2012). An important question is how people develop their

perception of these consequences. Values and goals may play an important role in this process.

Value theory mainly focuses on how people prioritize values and how that might affect their general attitudes towards, in this case, energy alternatives. The current reasoning extends the theory and proposes that values may also colour people's perception of various consequences of energy alternatives. This is based on the assumption that when people judge an object in terms of how well it facilitates the pursuit of their prominent goals, the goal-based valence of this judgement can have a halo effect and colour evaluations of various object characteristics. It is therefore hypothesised that values will guide the evaluation of the perceived consequences of energy alternatives in the same direction as they guide attitudes towards these alternatives (Hypothesis 3). Specifically, the stronger their egoistic values, the more positive consequences people will ascribe to nuclear energy, whereas the less positive consequences they will ascribe to renewable energy. Conversely, the stronger their biospheric values, the less positive consequences people will ascribe to nuclear energy, whereas the more positive consequences they will ascribe to renewable energy.

There is some initial support for this hypothesis. In one study, the stronger their egoistic values, the more advantages (including reduced CO_2 emissions), but not disadvantages, people ascribed to nuclear energy, whereas for those with strong biospheric values, the opposite was true (De Groot et al., 2012). In another study, people with strong altruistic values were most likely to expect communal economic benefits from wind energy, whereas those with strong traditional values were less likely to have this belief (Bidwell, 2013). However, the evidence is again scattered across studies using various value measures and each focusing on a single energy alternative. If people really ascribe consequences to energy alternatives in line with their value-based attitudes towards these

alternatives, one should be able to find that the effects of values on the perceived consequences, like on attitudes, systematically vary across energy alternatives. Accordingly, the current study measured the relationships between egoistic and biospheric values, on the one hand, and the perceived environmental and individual consequences of nuclear and renewable energy, on the other hand. Finding that these relationships follow the same pattern as the value-attitude relationships for different energy alternatives would provide initial evidence for a halo effect of the goal-based valence.

Importantly, if the goal-based valence indeed causes a halo effect, it could theoretically affect evaluations of object characteristics that are not necessarily directly relevant to the goal. Thus, values could colour the perceived consequences of energy alternatives, irrespective of how important these consequences are to people on the basis of their values. It has indeed been argued that people evaluate some costs and benefits of objects based on their general attitudes or feeling towards an attitude object (Alhakami & Slovic, 1994; Poortinga & Pidgoen, 2005). For example, people may express little support for, say, renewable energy and at the same time perceive it as having poor environmental consequences. Yet, this might not necessarily mean that the perceived poor environmental consequences caused the lack of support for renewable energy. It could be that people derived this perception from their general negative attitude towards renewable energy, that is, people may evaluate the environmental consequences of renewable energy as poor because they do not have a favourable attitude towards renewable energy. However, it has not been studied how this general attitude or feeling develop. The current goal-based reasoning posits that people base their attitudes towards energy alternatives on the consequences of these alternatives for their prominent goals, which, in turn, are determined by their values. Next, people may derive their perception of other consequences of energy alternatives that are not particularly important to them, in a way that supports their value-

based attitudes towards these alternatives. Thus, values may have far reaching effects on the perceived consequences of energy alternatives (irrespective of how important these consequences are to people), due to a halo effect of the goal-based valence. To test this, the current study compared the effects of values on the *perceived importance* of consequences of energy alternatives and on the *perceived likelihood* that energy alternatives have these consequences. The question was whether people would ascribe certain consequences to energy alternatives, thus supporting their value-based attitudes towards these alternatives, even if these consequences were not particularly important to them given their values. Such findings would provide stronger evidence for a halo effect of the goal-based valence.

To sum up, it is proposed that values are chronically activated overarching goals that guide people's goals in a given situation and influence their evaluations of energy alternatives in three important ways. Values are expected to I) guide the perceived importance of consequences of energy alternatives, II) shape general attitudes towards energy alternatives, and III) colour the perception of consequences of energy alternatives. While value-driven importance ratings should be consistent across energy alternatives, value-driven attitudes and the perception of consequences should systematically vary for different energy alternatives, depending on which consequences an energy alternative is expected to have for one's value-based prominent goals.

5.2. Method

Two studies with general samples of the Dutch population were conducted to test the hypotheses about the effects of values on evaluations of nuclear energy (Study 1) and local renewable energy system (Study 2)[c]. In this section, the materials used in each study are described. Values were measured in the same way in both studies. In order to cross-

[c] Evaluations of localized renewable energy were studied, since the use of renewable energy sources implies a shift from central to local energy systems (Wolsink, 2012).

validate the results and to test the generalizability of the results, the measures of evaluations of energy alternatives (i.e. the perceived importance of consequences, general attitudes, and the perception of consequences) were intentionally varied. If the same values demonstrate the expected relationship across studies, irrespective of the slightly different methods used for measuring the dependent variables, that would provide strong support that the relationship indeed exists and is not merely an artefact of a specific measurement used (Pelham & Blanton, 2003). Results from both studies are reported in section 5.3, allowing for a comparison of the effects of values on evaluations of nuclear and renewable energy, respectively.

5.2.1. Study 1: The influence of values on evaluations of nuclear energy

Participants and procedure

Study 1 was carried out via an online survey system with respondents from a pre-recruited panel of the Dutch population. Participants received an email with an invitation to complete an online study on public views on nuclear energy. They could access the study via the website, where instructions on how to complete the study were provided. At the end of the study, participants received an email address with which to contact the researcher with questions, were thanked for their participation, and received a token amount of money for participation. In total, 279 respondents participated in the study[d]. Of those, 170 were men and 108 were women (one respondent did not indicate gender), varying in age from 20 to 62 (M = 47.63, SD = 8.29). Given these characteristics, as well as sample distribution across education and income groups (see Appendix A), the current sample was considered to be reasonably representative of the Dutch population (www.cbs.nl).

[d] Across both studies, not all participants completed all items in the questionnaires, resulting in varying sample sizes across the analyses. The numbers of responses for each measure are reported. Numbers of responses available for each analysis are available from the first author upon request.

Measures

Values. First, respondents' biospheric and egoistic values were measured by means of a brief version of Schwartz's (1992) value scale (Steg et al., in press)[e]. Participants received a list of values accompanied by short descriptions and were asked to rate the importance of these values "as guiding principles in their lives" on a 9-point scale from -1 *opposed to my principles*, 0 *not important*, to 7 *extremely important*. Egoistic values were represented by five items: social power, wealth, authority, influential, and ambitious. Importance ratings for these items were averaged to form a composite scale of egoistic values (α [269] = .80, $M = 2.24$, $SD = 1.39$). Biospheric values were represented by four items: preventing pollution, respecting the earth, unity with nature, and protecting the environment. Importance ratings for these items were averaged to form a composite scale of biospheric values (α [276] = .90, $M = 4.90$, $SD = 1.39$).

Next, respondents read a short description of nuclear energy in the Netherlands, which was pertinent to the time when the study was conducted. The information was basic and same to all respondents. Afterwards respondents received a battery of questions on their opinions of nuclear energy. Items relevant for the current study are described below[f].

Consequences of nuclear energy. A number of "potential consequences" of nuclear energy were introduced, asking respondents to evaluate the importance of these consequences to them and the extent to which they perceived that nuclear energy would have these consequences. These consequences were not framed as facts, but as possibilities, which respondents could judge as likely or unlikely. Effort was taken to control for the alternate explanation that importance ratings may not be congruent with people's important values but vary across energy alternatives, depending on people's attitudes towards and the

[e] The value scale also measured hedonic and altruistic values, but they are not directly relevant to the goals of this research and are not further discussed.
[f] Full questionnaires used in both studies are available from the first author upon request.

perceived consequences of these alternatives. Specifically, respondents were asked to rate the importance of consequences *after* they have reported their perceived likelihood of these consequences for nuclear energy. While value-driven perception of consequences should follow the same pattern as value-driven attitudes towards nuclear energy, it was expected that the perceived importance of consequences would be congruent with people's important values.

A number of consequences were chosen and framed in the way that they often occur in public debates on nuclear energy, namely as valenced arguments (see De Groot & Steg, 2010; De Groot et al., 2012; Teräväinen et al., 2011). Statements about various positive and negative consequences of nuclear energy were provided. As specified by the hypotheses, only individual and environmental consequences were included in this study (see Appendix B for other consequences included in the questionnaire).

Perceived likelihood. Respondents were first asked to evaluate how likely, they think, the utilization of nuclear energy would result in the listed consequences, on a 7-point scale from 1 *very unlikely* to 7 *very much likely*. Individual consequences included: economic growth, cheaper energy, and increased employment. Environmental consequences included: reduced climate change, threatened quality of nature and the environment (reversed coding), and reduced CO_2 emissions. Ratings for the corresponding items were averaged to form the composite scales of the perceived likelihood of individual (α [279] = .85, M = 3.97, SD = 1.40) and environmental (α [276] = .67, M = 3.93, SD = 1.32) consequences of nuclear energy, with higher ratings representing the perception that more positive (or less negative) consequences are likely.

Perceived importance. Next, respondents rated the importance of the same individual and environmental consequences to them, on a 7-point scale from 1 *not at all*

important to 7 *very important*. All items were now framed positively to better fit the question of perceived importance (the environmental consequence "threatened quality of nature and the environment" was reframed as "the quality of nature and the environment"). Ratings for the corresponding items were averaged to form the composite scales of the perceived importance of individual (α [276] = .79, *M* = 5.10, *SD* = 1.05) and environmental (α [276] = .80, *M* = 5.57, *SD* = 1.02) consequences, with higher ratings representing higher perceived importance.

Attitudes towards nuclear energy. Respondents were asked to what extent they agreed, on a 7-point scale from 1 *completely disagree* to 7 *completely agree*, with the following statements: "I find the use of nuclear energy acceptable", "I find it acceptable to build a new nuclear power station in the Netherlands", "I find it acceptable that a part of the overall energy mix in the Netherlands consists of nuclear energy", and "I find it acceptable to use more nuclear energy in the Netherlands than is used now" (adapted from De Groot et al., 2012). Ratings for these items were averaged to form a composite scale of attitudes towards nuclear energy (α [274] = .995[g]; *M* = 3.76, *SD* = 2.13), with higher ratings representing more positive attitudes.

5.2.2. Study 2: The influence of values on evaluations of renewable energy

Participants and procedure

Study 2 was a paper-and-pencil study. An interviewer approached people in public places (e.g. on a train, in a public library) in the Netherlands and asked them to take part in the study. In total, 143 people completed the questionnaire. Of those, 65 were men and 73 were women (five respondents did not indicate gender), varying in age from 17 to 83 (*M* =

[g] The four items measuring attitudes towards nuclear energy overlapped to a large extent. A similarly large overlap of these items was observed in a previous study (α = .98; De Groot et al., 2012). This is not considered as particularly problematic in this study, since each separate item yielded the same conclusions for the hypotheses as the overall scale.

39.49, *SD* = 19.25). While individuals with a higher education level were slightly overrepresented (see Appendix A), the current sample was considered to be representative of the Dutch population (www.cbs.nl).

Measures

Values. The same values measure as in Study 1 was used. Again, importance ratings for the egoistic value items were averaged to form a composite scale of egoistic values (α [135] = .81, *M* = 2.43, *SD* = 1.33), and importance ratings for the biospheric value items were averaged to form a composite scale of biospheric values (α [136] = .91, *M* = 4.33, *SD* = 1.65).

Next, respondents read a short description of local renewable energy system (later in the questionnaire referred to as local energy services). Several examples of renewable energy sources (e.g. wind, water stream) were provided and differences from the traditional central energy system were explained. Again, the information was very basic and same to all participants. Items relevant for the goals of this study are described below.

Consequences of renewable energy. In Study 2, the importance ratings were provided first, but while half of the respondents rated the importance of consequences of localized renewable energy, the other half of the respondents rated the importance of consequences of energy alternatives in general. If value-congruent importance ratings are found not only for specific energy alternatives but also for energy alternatives in general (before introducing specific energy alternatives), it would further rule out the alternate explanation that importance ratings are influenced by one's attitudes and the perceived consequences of a specific energy alternative.

A number of consequences were chosen that often occur in public debates on renewable energy sources (Arkestijn & Oerlemans, 2005; Teräväinen et al., 2011;

Wolsink, 2000; 2007). In order to cross-validate the results, the consequences were now framed in a neutral way, and thus differently when compared to valenced arguments used in Study 1. As specified by the hypotheses, only environmental and individual consequences were included in this study (see Appendix B for other consequences included in the questionnaire).

Perceived importance. Respondents were first asked to rate the importance, on a 7-point scale from 1 *not at all important* to 7 *very important*, of the listed consequences to them, either of localized renewable energy or of energy alternatives in general. Individual consequences included: energy prices, possibility to provide enough energy to satisfy the needs of households, effects of energy use on daily comfort, and stability of energy prices[h]. Environmental consequences included: amount of CO_2 emissions, effects on environmental problems such as the greenhouse effect, and effects on environmental quality. Ratings for the corresponding items were averaged to form the composite scales of the perceived importance of individual and environmental consequences of localized renewable energy ($\alpha_{ind.}$ [70] =.70, $M_{ind.}$ = 5.01, $SD_{ind.}$ = 1.02; $\alpha_{env.}$ [70] =.83, $M_{env.}$ = 4.84, $SD_{env.}$ = 1.20) and of energy alternatives in general ($\alpha_{ind.}$ [67] = .74, $M_{ind.}$ = 4.78, $SD_{ind.}$ = 1.00; α [69]$_{env.}$ = .91, $M_{env.}$ = 5.10, $SD_{env.}$ = 1.21).

Perceived likelihood. Next, all respondents evaluated the likelihood of localized renewable energy having the above individual and environmental consequences, listed in a different order. Subjects evaluated the neutrally framed items on an 11-point scale from -5 *very negative* to 5 *very positive*. For individual consequences, they assessed the effects of

[h] Two other individual consequences were included, namely level of employment and amount of shortcuts and malfunctions. However, the perceived importance and likelihood of employment correlated poorly with the perceived importance and likelihood of other individual consequences of renewable energy, and hence this item was excluded from the analyses. For the amount of shortcuts and malfunctions, including the evaluation of its likelihood would have reduced the reliability of the perceived likelihood of individual consequences scale to $\alpha < .60$, and hence this item was excluded from the analyses. Including these two individual consequences in the analyses yielded the same conclusions for the hypotheses as when they were excluded.

the utilization of renewable energy on energy prices (from -5 *strongly decrease* to 5 *strongly increase*; reversed coding), satisfaction of energy needs of households (from -5 *household energy needs will be satisfied worse* to 5 *household energy needs will be satisfied better*), stability of energy price (from -5 *will be less stable* to 5 *will be more stable*), and daily comfort (from -5 *strongly decrease* to 5 *strongly increase*). For environmental consequences, subjects assessed the effects of renewable energy on CO_2 emissions (from -5 *strongly decrease* to 5 *strongly increase*; reversed coding), environmental quality (from -5 *strongly decrease* to 5 *strongly increase*), and environmental problems (from -5 *strongly decrease* to 5 *strongly increase*; reversed coding). Ratings for the corresponding items were averaged to form the composite scales of the perceived likelihood of individual (α [134] = .60, M = -.17, SD = 1.23) and environmental (α [140] = .73, M = .93; SD = 1.46) consequences of localized renewable energy, with higher scores representing the perception that more positive (or less negative) consequences are likely.

Attitudes towards renewable energy. A slightly different measure of attitudes, considered to better fit the context of renewable energy, was used in this Study than in Study 1. It was less focused on acceptability of the current utilization of an energy alternative in the Netherlands, and was more focused on general (dis)favour towards utilizing an energy alternative in the future. Attitude items correlated strongly in Study 1 and more diverse items were chosen in Study 2. Respondents were first asked to what extent they were against or in favour of localized renewable energy, on an 11-point scale from -5 *very much against*, 0 *neither against nor in favour*, to 5 *very much in favour* (M [130] = 1.12, SD = 1.83). Next, respondents indicated the extent to which they agreed, on a 7-point scale from 1 *completely disagree* to 7 *completely agree*, with the following statements: “I am interested in local energy services” (M [137] = 3.74, SD = 1.56) and “I will certainly use

local energy services" (*M* [137] = 3.91, *SD* = 1.50). The z-scores for these three items were averaged to form a composite scale of attitudes towards localized renewable energy (α [125] = .81).

5.3. Results

In both studies, the hypotheses were tested by using Pearson's correlations[i]. Correlational analyses are considered to serve the current research goals better than regression analyses, as the main interest lies in the strength and direction of the bivariate relationships between the different value types and people's evaluations of energy alternatives, as reflected in the hypotheses.

5.3.1. Values and the perceived importance of consequences of energy alternatives

In line with Hypothesis 1, respondents rated the consequences of energy alternatives that are congruent with their important values as particularly important (see Table 1). That is, the stronger their egoistic values, the more importance respondents ascribed to individual consequences of nuclear and renewable energy, as well as of energy alternatives in general. Interestingly, stronger egoistic values tended to correlate negatively with the perceived importance of environmental consequences of energy alternatives (although this relationship was not significant for renewable energy). In contrast, as expected, stronger biospheric values were related to ascribing significantly more importance to environmental consequences of nuclear and renewable energy, as well as of energy alternatives in general. There was no significant relationship between biospheric values and the perceived importance of individual consequences of energy alternatives. Such consistent findings

[i] Some variables in the analyses showed deviations from normal distribution (i.e. scores for the biospheric value scale and for the perceived importance of consequences of energy alternatives tended to follow a negatively skewed distribution, and scores for attitudes towards energy alternatives tended to follow a flat distribution). To control for these deviations, the hypotheses were also tested by using Spearman's rho correlations, which yielded the same conclusions. To be consistent, Pearson's correlations are reported across the analyses.

across the two studies support the assumption that values determine which goals are prominent to people, irrespective of a given energy alternative. This implies that values can guide the perceived importance of consequences of many different energy alternatives. Results also ruled out the alternate explanation that importance ratings are influenced by people's attitudes and the perceived consequences of a specific energy alternative, as the value-congruent importance ratings were found irrespective of whether these ratings were provided after (Study 1) or before (Study 2) evaluations of the perceived consequences of energy alternatives, and occurred not only for specific energy alternatives (Study 1 and 2) but also for energy alternatives in general (Study 2).

5.3.2. Values and attitudes towards energy alternatives

In line with Hypothesis 2, respondents' attitudes towards energy alternatives depended on the perceived consequences of these alternatives for their value-based prominent goals (see Table 1). As expected, the stronger their egoistic values, the more respondents favoured nuclear energy, whereas the stronger their biospheric values, the less they favoured this energy alternative (Study 1). In contrast, stronger egoistic values were linked to less favourable attitudes towards renewable energy, whereas stronger biospheric values were linked to more favourable attitudes towards this energy alternative (Study 2). Thus, nuclear and renewable energy indeed yielded exact opposite patterns of the value-attitude relationship. This implies that values can guide attitudes towards many different energy alternatives, but yield different outcomes depending on the perceived consequences of these alternatives for people's value-based prominent goals.

5.3.3. Values and the perception of consequences of energy alternatives

The results also provided support for Hypothesis 3. Indeed, values influenced the perceived consequences of energy alternatives in the same direction as they influenced attitudes towards these alternatives (see Table 1). As expected, in Study 1, the stronger their egoistic values, the more positive (or less negative) consequences, including individual and environmental consequences, respondents ascribed to nuclear energy. The stronger their biospheric values, the less positive (or more negative) consequences, particularly environmental consequences, respondents ascribed to nuclear energy. As predicted, in Study 2, the opposite relationship between values and evaluations of consequences was observed for renewable energy. Stronger egoistic values were linked to less positive (or more negative) evaluations of consequences, particularly environmental consequences, of renewable energy. Stronger biospheric values were linked to more positive (or less negative) evaluations of consequences, particularly individual consequences, of renewable energy. The results support the assumption that values can colour the perceived consequences of energy alternatives, in line with the value-based attitudes towards these alternatives. This provides initial evidence for a halo effect of the goal-based valence.

As predicted for the halo effect, values coloured the perceived consequences of energy alternatives, irrespective of how important these consequences were to people. For example, while stronger egoistic values were in fact associated with lower perceived importance of environmental consequences of energy alternatives, these values nevertheless enhanced more positive evaluations of environmental consequences of nuclear energy and less positive evaluations of environmental consequences of renewable energy. Next, although individual consequences of energy alternatives were not very important to those with strong biospheric values, these same respondents evaluated individual consequences of localized renewable energy most positively (or less

negatively). Thus, it indeed seems that people base their attitudes towards energy alternatives on the consequences of these alternatives for their value-based prominent goals and they judge other consequences in line with these attitudes.

Table 1. *The relationship (Pearson's correlations) between values and evaluations of nuclear (Study 1) and renewable (Study 2) energy.*

Study 1: Nuclear energy		Egoistic values	Biospheric values
Importance of	individual consequences	r = .20*** (.001)	r = -.01 (.898)
	environmental consequences	r = -.15* (.017)	r = .53*** (<.001)
Attitudes		r = .24*** (<.001)	r = -.34*** (<.001)
Perception of	individual consequences	r = .25*** (<.001)	r = -.09 (.141)
	environmental consequences	r = .17** (.005)	r = -.25*** (<.001)
Study 2: Renewable energy		Egoistic values	Biospheric values
Importance of	individual consequences:		
	• renewable energy	r = .30* (.015)	r = -.05 (.701)
	• energy alternatives in general	r = .48*** (<.001)	r = -.04 (.763)
	environmental consequences:		
	• renewable energy	r = -.18 (.154)	r = .57*** (<.001)
	• energy alternatives in general	r = -.29* (.021)	r = .72*** (<.001)
Attitudes		r = -.25** (.007)	r = .33***(<.001)
Perception of	individual consequences	r = -.02 (.836)	r = .19* (.036)
	environmental consequences	r = -.26** (.003)	r = .12 (.157)

*$p \leq .05$, **$p \leq .01$, ***$p \leq .001$ (p-values are reported in brackets).

5.4. General discussion

The aim of this paper was to empirically test the premise that people evaluate energy alternatives based on the implications of these alternatives for their prominent goals, which are determined by their values. Two studies on nuclear and renewable energy were designed to test theory-driven hypotheses on the relationship between values and I) the perceived importance of consequences of energy alternatives, II) general attitudes towards energy alternatives, and III) the perceived likelihood that energy alternatives have certain positive or negative consequences.

The results supported the hypotheses. First, respondents consistently prioritized consequences of energy alternatives that are congruent with their important values. This indicates that values determine which goals are prominent to people in a given situation. Second, as expected, respondents expressed more positive (or less negative) attitudes towards an energy alternative that is seen as fulfilling their value-based prominent goals, whereas they expressed less positive (or more negative) attitudes towards an energy alternative that is not seen as fulfilling their value-based prominent goals. Third, as predicted, values seemed to colour the perceived consequences of energy alternatives, producing the same patterns of relationship as for value-based attitudes. This implies that the goal-based valence can cause a halo effect and colour evaluations of various characteristics of energy alternatives, even if these characteristics are not very important to people given their values. The results were found systematically across the two studies and were not affected by variations in the methods used. This provides strong evidence that values affect evaluations of energy alternatives in three important ways. The effects of values may generalize to many different energy alternatives, depending on the implications of these alternatives for people's value-based prominent goals.

5.4.1. Theoretical implications

The current reasoning builds on and extends value theory. It has been established in literature that people hold positive attitudes towards objects that support their important values, whereas they hold negative attitudes towards objects that threaten their important values (see Steg & De Groot, 2012; Stern, 2000). Some initial evidence in the energy domain supports this assumption also (Bidwell, 2013; De Groot et al., 2012; Whitfield et al., 2009). However, value theory is mute about the role of the goal qualities of values in this relationship. It was argued here that values are chronically activated overarching goals that determine what specific goals are prominent to people in a given situation. That, in turn, affects which aspects in a situation people attend to most for their evaluations. In support of this reasoning, the results explicitly showed that values guide the perceived importance of consequences of energy alternatives. People indeed considered the consequences of energy alternatives for their prominent goals (determined by their values) as particularly important. This study controlled for and ruled out the possibility that importance ratings are coloured by people's attitudes and perceived consequences of a specific energy alternative. This implies that values provide a stable basis for which goals people pursue and what they find important, irrespective of which energy alternative is evaluated.

This study extends previous work on the relationship between values and attitudes towards energy alternatives (Bidwell, 2013; De Groot et al., 2012, Whitfield et al., 2009), by systematically comparing this relationship for two different energy alternatives. Such a comparison was not possible so far, as studies used various value measures and typically focused on a single energy alternative. By studying the relationship between egoistic and biospheric values, on the one hand, and attitudes towards nuclear and renewable energy, on the other hand, this study captured the predicted opposite patterns of relationship between

values and attitudes towards these energy alternatives. The current results make a novel contribution to the literature, as they demonstrate the generalizability of the effects of values on attitudes towards different energy alternatives and show that the valence of this relationship (i.e. positive or negative) depends on the implications of energy alternatives for people's value-based prominent goals.

Finally, it was proposed and demonstrated in this paper that values can colour the perception of consequences of energy alternatives, due to a halo effect of the goal-based valence. Value theory so far focused exclusively on how people prioritize values and how that influences their attitudes. This cannot explain, however, why people sometimes perceive the consequences of energy alternatives differently. While it has been argued that people may derive perceptions of some costs and benefits from their general attitude towards an attitude object (Alhakami & Slovic, 1994; Poortinga & Pidgoen, 2005), the question of how this attitude develops remained. In the current studies, values seemed to act as a third variable influencing both attitudes towards and the perceived consequences of energy alternatives. By comparing value-driven importance ratings and value-driven perception of consequences, this study managed to show that values can colour the perceived consequences of energy alternatives, irrespective of how important these consequences are to people given their values. Thus, values can have far reaching effects on the perceived consequences of energy alternatives, due to a halo effect of the goal-based valence. This possibility has been underexplored in value literature, which builds an important theoretical contribution of the current work.

5.4.2. Practical implications

The results reported here demonstrate that people with different values have different goals in a given situation and attend to different aspects of energy alternatives when evaluating

these alternatives. For example, low energy prices may be very relevant for people with strong egoistic values, and hence likely to promote their positive evaluations of energy alternatives that are relatively cheap. This might be less persuading to people with strong biospheric values, who are primarily concerned with the effects of energy alternatives on the environment. This has important implications for the effectiveness of information strategies for promoting energy alternatives. Specifically, providing information that is not important to people's key values is not likely to influence their evaluations, whereas information that resonates with their important values might be more effective (see Bolderdijk, Gorsira, Keizer, & Steg, in press). Tailoring information to people's important values might thus be an effective strategy to influence evaluations in the energy domain (see Abrahamse, Steg, Vlek, & Rothengatter, 2007).

More importantly, even if information is relevant to people's important values, it might not have the desired effects on evaluations if people do not consider a given energy alternative as facilitating the goals driven by their important values. The current results suggest, for example, that people with strong (versus weak) biospheric values are less likely to agree with arguments that nuclear energy, generally associated with environmental disadvantages, might have some benefits for the environment. This suggests that providing information on environmental benefits of nuclear energy is unlikely to promote positive evaluations among those with strong biospheric values. It might sometimes be necessary to actually change the characteristics of energy alternatives so that they have more positive (or less negative) consequences for people's prominent value-based goals (e.g. enhancing safety measures of nuclear energy or using alternative technology, such as thorium-based nuclear power). Such changes are needed most when severe barriers for using energy alternatives exist (e.g. hazardous pollution levels, unaffordable energy prices), which may inhibit the positive effects of values on evaluations

of energy alternatives. For example, this study found that people with strong biospheric values favoured renewable energy and even evaluated its individual consequences relatively positively. However, biospheric values may lose their positive effect on evaluations if the costs of renewable energy are so high that most people cannot afford it. While actual changes in energy alternatives may not always be possible or may be highly costly, (sustainable) energy policies should nevertheless try to consider and target people's important values (see Butler et al., 2013; Parkhill et al., 2013 for a similar argument in the context of sustainable energy transitions).

While it is often assumed in practice that financial arguments are most important to people, the current results indicate that this is not necessarily the case. Next to egoistic values, biospheric values play an important role in evaluations of energy alternatives. Thus, people seem to find environmental consequences of energy alternatives important. This means that environmental, rather than financial, appeals or incentives may sometimes be more effective in changing evaluations of energy alternatives, particularly for those with strong biospheric values. There is indeed evidence to suggest that environmental appeals are more effective than financial appeals in encouraging sustainable choices (Bolderdijk, Steg, Geller, Lehman, & Postmes, 2013; Thøgersen, 2013; see Evans et al., 2013 for evidence that environmental appeals are more likely than financial appeals to ensure a variety of sustainable behaviours).

The current results suggest that policy makers need to be cautious when interpreting people's perceptions of consequences energy alternatives, as these perceptions may be under the influence of a halo effect of the goal-based valence. For example, less favourable attitudes towards renewable energy and poor evaluations of its environmental consequences were prominent among people with strong egoistic values, who in fact rated individual rather than environmental consequences of energy alternatives as important.

These people seem to have derived their (poor) environmental evaluations from their general (negative) attitudes towards renewable energy. Trying to convince them that renewable energy has environmental benefits is not likely to change their evaluations. It is proposed that policy makers should try and identify the "true" drivers of people's attitudes, by taking values into account. Interventions need to target the particular consequences that are most important to people given their important values.

5.4.3. Future research

Various renewable energy sources were compiled under the label of locally produced renewable energy in this study. This allowed testing the hypotheses for renewable energy in general, irrespective of which particular source respondents had in mind. Future research could study the effects of values on evaluations of specific renewable energy sources, for example, biomass, ocean sources, geothermal heat, wind and solar power.

An interesting question for future research is whether the effects of values on evaluations depend on how much knowledge people have about energy alternatives. Is it necessary that people know much about a certain energy alternative and its potential implications for their value-based prominent goals for the effects of values to occur? It is likely that respondents in this study did not have much knowledge about localized renewable energy, yet their evaluations of this energy alternative were related to their values. It could be that some immediate associations between energy alternatives and various goals provide a sufficient basis for the influence of values on evaluations. This could not be tested in this study, as knowledge about energy alternatives was not measured. Future studies could test the role of knowledge in the relationship between values and evaluations of energy alternatives.

Given the correlational nature of the current results, definite conclusions cannot be made about the causal relationship between attitudes towards energy alternatives and the perceived consequences of these alternatives. The fact that some consequences were not particularly important given certain values but nevertheless came under the influence of value-driven evaluations suggests that these perceived consequences were a result rather than a cause of value-based attitudes (i.e. they were "haloed"). However, future experimental studies need to test such causal inferences in detail.

To test the robustness of the current findings, future studies could examine the relationship between values and evaluations of diverse energy sources and technologies, and across different countries and cultures.

5.5. Conclusion

In general, people's evaluations of energy alternatives, including the perceived importance of consequences, general attitudes, and the perception of consequences, were systematically linked to their values. This supports the assumption that values determine which goals are prominent to people when evaluating energy alternatives and guide these evaluations accordingly. In order to better understand people's evaluations of energy alternatives, it is important to take values into account and to consider what consequences people generally expect from energy alternatives for the value-based prominent goals.

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Appendix A

Sample characteristics in Study 1 (N = 279) and Study 2 (N = 143)

Study 1	
Age	M = 47.63; SD = 8.29 [min = 20; max = 62]
Gender	**Valid %**
Male	61.2
Female	38.8
Highest completed level of education	**Valid %**
Primary	1.4
Lower vocational or technical	18.7
Intermediate vocational or secondary	36.7
Higher vocational or highest secondary	27.3
College or university degree	14.7
Other	1.1
Net income per household per month (in euros)	**Valid %**
< 1000	6.9
1000-2000	25.0
2000-3000	28.5
3000-4000	21.9
4000-5000	10.0
> 5000	7.7
Study 2	
Age	M = 39.49; SD = 19.25 [min = 17; max = 83]
Gender	**Valid %**
Male	47.1
Female	52.9
Highest completed level of education	**Valid %**
Primary	.7
Lower vocational or technical	1.4
Intermediate vocational or secondary	14.5
Higher vocational or highest secondary	51.5
College or university degree	31.9
Net income per household per month (in euros)	**Valid %**
< 750	13.0
750-1500	15.4
1500-2250	12.2
2250-3000	21.1
3000-3750	13.0
3750-4500	8.9
> 4500	16.3

Appendix B

Other (not specified by the current hypotheses) "potential consequences" of energy alternatives included in Study 1 and Study 2 (provided in the same order as they appeared in the study)

Study 1

Perceived likelihood: *increased risks of accidents for future generations*, *increased health risks for people in the Netherlands*, *increased risks of accidents with nuclear waste*, *increased risks of accidents due to transportation of nuclear waste to storage locations*.

Perceived importance: *low risks of accidents for future generations, low health risks for people in the Netherlands*, *lower possibility of accidents with nuclear waste*, *low risks of accidents due to transportation of nuclear waste to storage locations*.

Study 2

Perceived importance (respondents evaluated these either for energy alternatives in general or for localized renewable energy): *the extent to which you have influence in energy policy*, *the extent to which you know where your energy comes from*.

Perceived likelihood (evaluated for localized renewable energy only): *I will know where my energy comes from: strongly disagree vs strongly agree*, *I will have less vs more influence on energy policy* (for explorative reasons and to answer specific questions from practitioners, additional items were included in the task on the perceived likelihood, which are not reported here as they were not based on the current theory and were not included in the task on the perceived importance).

Chapter 6

GENERAL DISCUSSION

This PhD thesis sought to explain how people arrive at their evaluations of sustainable products and which factors play a role in this process. We addressed these questions by taking a goal-based approach, with a key premise that people evaluate sustainable products positively if they see these products as facilitating their goals (i.e. as enabling them to fulfil their goals), whereas people do not evaluate these products positively, if they don't see them as facilitating their goals. Goal framing theory posits that three overarching goals can guide evaluations: hedonic, gain, and normative goals (Lindenberg & Steg 2007; 2013a). "Overarching" means that a goal may have many sub-goals that are specific to this overarching goal and that may guide evaluations. The crucial question is which overarching goal becomes dominant in a given situation, thereby making the corresponding sub-goals strong and guiding evaluations of sustainable products most, and under which conditions. To answer this question, we developed a conceptual framework that explains evaluations of sustainable products based on goal theory and value theory (see Figure 1). The framework posits that two key factors determine the relative strength of goals in a situation: situational cues and individual values. Next, the framework explains how goals influence evaluations of sustainable products. Specifically, goal-driven evaluations depend on the extent to which a product is seen as facilitating one's goals. The valences of this goal-driven evaluation can cause a halo effect and colour evaluations of specific product characteristics that may even be unrelated to the goal. We tested our conceptual framework in a series of studies. As a case in point, we focused on evaluations of pro-environmental food products and energy alternatives. In this chapter, we will discuss the extent to which the conceptual framework was supported by the findings across different studies. We will explain how the framework and the current findings help us understand evaluations of sustainable products. Next, we will discuss the wider theoretical implications of the proposed conceptual framework for both goal theory and value theory, and identify

important questions to be addressed in future research on evaluations of sustainable products. We will end with practical implications for interventions aimed at securing positive evaluations and public support for sustainable products.

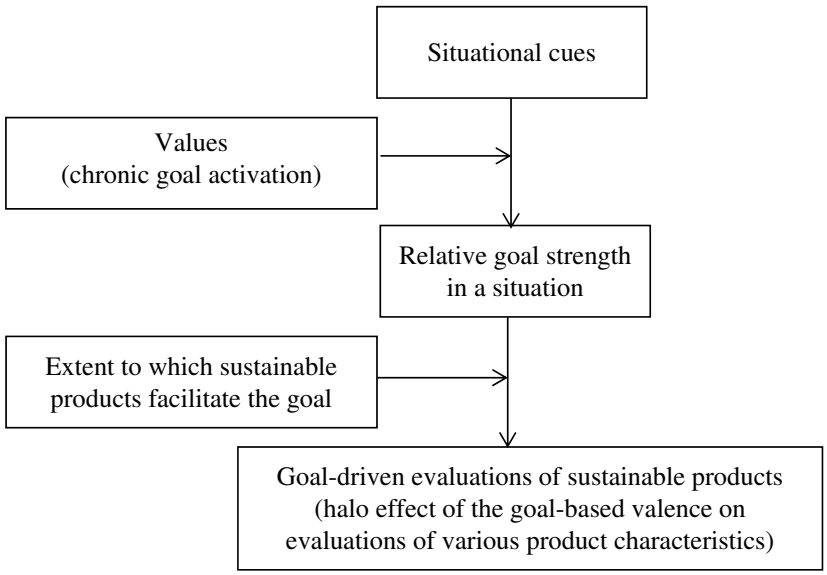

Figure 1. Goal-based approach to evaluations of sustainable products

6.1. Main findings and implications for explaining evaluations of sustainable products

6.1.1. Factors influencing the relative strength of goals in a situation

We studied the effects of two key factors, namely situational cues and individual values, on the relative strength of goals in a situation. Importantly, we studied how these factors interact when shaping evaluations of sustainable products.

Situational cues. We proposed that a goal is more likely to become strong in a situation and guide evaluations of sustainable products if it is primed by cues in that situation.

Although situational cues have been shown to prime relevant goals (Bargh, 2006; Bargh, Gollwitzer, Lee-Chai, Barndollar, & Trötschel, 2001; Kruglanksi et al., 2002), an alternative explanation remains that situational cues could prime purely semantic associations, which may affect subsequent evaluations irrespective of one's goals (see Förster, Liberman, & Friedman, 2007). Therefore, an important question for the current research was whether semantic and goal priming effects can co-exist. Specifically, we studied whether situational cues can prime goals, irrespective of the semantic associations that may be triggered by these cues. Two experimental studies reported in Chapter 2 provided evidence of so-called parallel priming effects. As expected, we found that the same prime elicited semantic priming effects as well as goal priming effects in the same sample. More specifically, after exposure to an experimental (pleasure-related or excellence-related) versus control prime, participants evaluated another person more in the direction of the prime, which could not be interpreted as goal pursuit and most likely occurred due to activation of purely semantic associations. Typical for semantic priming, these effects were short-lived. More importantly, the same experimental prime subsequently made participants pursue a prime-relevant goal, as evidenced in their behavioural choices and actual behaviour. As expected for goal priming effects, these effects were longer-lasting. The findings thus supported the base assumption in our conceptual framework that situational cues can influence the relative strength of goals in a situation, and showed that this relationship exists irrespective of purely semantic associations that can be triggered by the same cues.

We also found in Chapter 2 that, while a hedonic prime by itself had the expected goal priming effects, an excellence prime needed to be reinforced by a goal-supporting situation in order for the goal priming effects to show up. This finding corresponds to the premise in goal framing theory that the overarching hedonic goal is a priori the strongest

and needs less situational support than the gain and, especially, the normative goal (Lindenberg & Steg, 2007).

Differences between semantic and goal priming effects, and especially the phenomenon of parallel priming, suggest that evaluations of sustainable products are more complex than one might anticipate. It is often expected that people associate "green" with "good" and should therefore evaluate sustainable products positively. This association is seen very much as a purely semantic association, since it is expected to be the same for everybody and to apply to all kinds of sustainable products. However, even if people do semantically associate "green" with "good", this association needs to be primed in a situation in order to affect product evaluations. And even if primed, it will only have short-lived effects on evaluations, which is typical for semantic priming effects. Yet, importantly, our results showed that, besides semantic associations, situational cues can also prime goals, which have longer-lasting effects on evaluations. We further argued and demonstrated in this PhD thesis that, different from the effects of purely semantic associations, goal effects are sensitive to people's values and to the type of products being evaluated. Therefore, it is important to study the conditions under which goals are primed and how they guide evaluations of sustainable products.

Values. Our conceptual model posits that, next to situational cues, values are another factor that influences the relative strength of goals in a situation. We conceptualise values as chronically activated overarching goals. It has been shown that values can be activated by value-relevant cues and influence individual evaluations and behaviour (Evans et al., 2013; Maio, Olson, Allen, & Bernard, 2001; Maio, Pakizeh, Cheung, & Rees, 2009), more likely so when values are strong (Hoogland, De Boer, Boersema, 2005; Verplanken & Holland, 2002). Building on these findings, we argue that overarching goals that are strongly chronically activated (i.e. important values) are likely to dominate in a situation and hence

may need little support from situational cues. We therefore hypothesized that explicit value primes may not be necessary for important values to yield goal effects on evaluations, since goals are already likely to be prominent if a person strongly endorses a relevant value. Sustainable products, which signal possibilities for attaining pro-environmental goals, could serve as subtle cues priming these goals, provided that people strongly endorse biospheric values. Indeed, we found in the studies reported in Chapter 3 that the stronger their biospheric values, the more positively people evaluated pro-environmental food products, provided that these products were seen as facilitating their pro-environmental goals. Most importantly, an explicit environmental prime did not affect the relationship between values and evaluations of pro-environmental food products. Apparently, the environmental prime was not necessary for the goal effects to occur, as the pro-environmental food products seemed to serve already as situational cues that prime pro-environmental goals for people with strong biospheric values. Information on people's values can thus inform us which goals are most likely to become strong in a situation, even when only subtle primes are present.

Interaction between cues and values: The same cues can prime different goals. We learned that sustainable products can serve as subtle primes of pro-environmental goals for people with strong biospheric values. Interestingly, however, sustainable products may have salient implications not only for the overarching normative goal and specifically for pro-environmental goals, but also for the hedonic or gain goal and their sub-goals. Sustainable products could therefore also prime gain or hedonic goals, if the corresponding overarching goals are strongly chronically activated, that is, if they are important values to people. We explored this possibility in Chapters 4 and 5, where we focused on evaluations of energy alternatives. Energy alternatives entail various aspects (e.g. price, environmental impact) that fulfil different goals (e.g. save money, protect the environment). We assumed

that people attend to particular aspects of energy alternatives that have consequences for the goals that are prominent to them on the basis of their values. For example, when exposed to the same energy alternative, people with strong *biospheric* values will focus on its consequences for the environment, whereas people with strong *egoistic* values will instead focus on its consequences for consumers' resources. People with different values may therefore evaluate energy alternatives differently, depending on how well these alternatives facilitate their value-based prominent goals. We first looked in the literature to see whether the patterns of results in prior studies would support this assumption (Chapter 4). We indeed found initial evidence that people evaluate energy alternatives positively if these alternatives are seen as facilitating their value-based prominent goals, whereas they do not evaluate energy alternatives positively (or even evaluate negatively), if these alternatives are not seen as facilitating their value-based prominent goals. This is in line with our assumption that energy alternatives prime different goals for people with different values. However, this evidence comes from studies using various value measures and typically focusing on a single energy alternative, which makes it difficult to systematically compare the effects of values on evaluations of different energy alternatives. Therefore, we next set out to empirically study the possible goal and value effects on evaluations of different energy alternatives.

We conducted two correlational studies testing the hypothesis that the same energy alternative may prime different goals for people with different values (Chapter 5). As a case in point, we studied evaluations of nuclear and renewable energy. While both energy alternatives have been promoted as (relatively) sustainable, the literature analysis reported in Chapter 4 revealed that people associate these energy alternatives with different consequences for their normative (pro-environmental) goals and gain goals. People generally associate (whether true or not) nuclear energy with disadvantages for the

environment and advantages for consumers' resources, whereas they associate renewable energy with advantages for the environment and disadvantages for consumers' resources. We studied whether evaluations of energy alternatives with such mixed perceived environmental and individual consequences could be linked to people's egoistic and biospheric values. As expected, we found that the stronger their egoistic values, the more people rated individual consequences of energy alternatives as important, whereas the stronger their biospheric values, the more they rated environmental consequences of energy alternatives as important. This suggests that, given their values, people indeed attend to different consequences of energy alternatives for their evaluation.

As expected, we found that people evaluated energy alternatives differently on the basis of their values. This was evidenced by people's attitudes towards energy alternatives, which reflects the extent to which they generally (dis)favour a specific energy alternative, as well as by their perception of how likely certain positive or negative consequences of energy alternatives are. More specifically, the stronger their egoistic values, the more people favoured nuclear energy and the more positive consequences they ascribed to it. Conversely, the stronger their egoistic values, the less they favoured renewable energy and the less positive consequences they ascribed to it. The opposite was true for biospheric values: the stronger their biospheric values, the more people favoured renewable energy and the more positive consequences they ascribed to it. Conversely, the stronger their biospheric values, the less they favoured nuclear energy and the less positive consequences they ascribed to it. This suggests that energy alternatives indeed primed different goals for people given their values, which affected evaluations of these alternatives.

The current findings illustrate the added value of the goal-based approach for explaining evaluations of sustainable products. Without taking people's goals, particularly

values, into account, it would be difficult to explain why the same products (in this case energy alternatives) elicit such different evaluations in people.

6.1.2. The effects of goals on evaluations of sustainable products

Given that situational cues and individual values determine the relative strength of goals in a situation, how do goals affect evaluations of sustainable products? Our conceptual model points out to two key qualities of goal effects on evaluations, further differentiating these effects from purely semantic priming effects. First, goal effects on evaluations depend on the extent to which sustainable products are seen as facilitating one's goals. Second, the goal-based valence can cause a halo effect and colour evaluations of various product characteristics.

The extent to which sustainable products facilitate one's goal. If sustainable products enable one to fulfil one's goals, they should be evaluated positively, whereas they should not be evaluated positively (or even evaluated negatively) if they do not facilitate one's goal pursuit. We tested this assumption by comparing the effects of biospheric values on evaluations of pro-environmental virtue and vice products (Chapter 3). Although all described as having pro-environmental qualities, virtue products, which generally fulfil the overarching normative goal, were seen by our participants as more suitable for attaining pro-environmental goals than vice products, which generally fulfil the overarching hedonic goal. Importantly, we found that the virtue-vice distinction moderated the effects of biospheric values on evaluations of pro-environmental food products. As expected, stronger (versus weaker) biospheric values enhanced positive evaluations of pro-environmental virtue products, but not of pro-environmental vice products. This supports our claim that even if normative (pro-environmental) goals are strengthened by situational cues (in this case pro-environmental food products) and strong biospheric values, they may

not yield positive evaluations of sustainable products, if these products are not seen as facilitating the pursuit of these goals.

Further evidence that the perceived "fit" between one's goals and a product influences product evaluations comes from studies on evaluations of energy alternatives reported in Chapters 4 and 5. The literature (Chapter 4) and our empirical findings (Chapter 5) suggest that energy alternatives can prime different goals, depending on people's values. We indeed observed that people evaluated energy alternatives according to the expected consequences of these alternatives for their value-based prominent goals.

The goal-based approach thus underlines that the kind of product matters for evaluations of sustainable products. Promoting products as sustainable may not yield positive evaluations, despite people's strong pro-environmental goals, if products are not seen as suitable for attaining pro-environmental goals. People need to perceive the product as actually facilitating pro-environmental goals, in order for the expected positive evaluations to occur. Furthermore, while promoted as sustainable, certain products may prime other than pro-environmental goals, depending on people's (hedonic or egoistic) values. Product evaluations will then depend on how well the product facilitates these other goals.

Halo effect of the goal-based valence. Our conceptual framework posits that goals can influence evaluations of various product characteristics that may not necessarily be directly relevant to these goals. Specifically, people judge a product based on how well it facilitates their goal pursuit and the valence of this goal-based judgement can then colour their evaluations of various (other) product characteristics. In support of this reasoning, the studies reported in Chapter 3 revealed that stronger (versus weaker) biospheric values enhanced positive evaluations of pro-environmental virtue products on various

characteristics that were not directly relevant to one's pro-environmental goals. As expected, no such positive halo effect was found for evaluations of pro-environmental vice products, which were seen as less suitable for pro-environmental goal pursuit. This suggests that the initial goal-based judgement indeed colours people's evaluations of various product characteristics: if a product facilitates their goal, people will evaluate it positively on various characteristics (even if these characteristics are not directly related to their goal), but if the product does not facilitate their goal, people will not evaluate it positively (or even evaluate negatively) on various characteristics.

We explicitly looked for possible "haloed" evaluations of energy alternatives (Chapter 5). We measured how important, given their values, people find various consequences of energy alternatives, as well as how they evaluate different energy alternatives with regard to these consequences. We found that some consequences of energy alternatives were not particularly important to people, but nevertheless came under the influence of their value-based evaluations. That is, people ascribed generally more positive consequences (whether these were important to them or not) to energy alternatives that were seen as facilitating their value-based prominent goals, whereas they ascribed generally less positive consequences (whether these were important to them or not) to energy alternatives that were not seen as facilitating their value-based prominent goals. This further supported our claim that the goal-based valence can colour evaluations of various product characteristics, even if these characteristics are not directly relevant to one's goals.

The phenomenon of goal-based valence causing a halo effect is important for understanding evaluations of sustainable products. There seems to be a sequence involved. People first mainly look at how well sustainable products facilitate their goals and form their overall evaluation accordingly. Next, they may use this overall evaluation to derive

evaluations of various product characteristics that may have little to do with their goals. One important implication of this is that unless we take the dynamics of goals into consideration, we do not know what characteristics of sustainable products truly matter for people's evaluations and which characteristics are only under the influence of a halo effect. For example, people may express little support for renewable energy and at the same time evaluate poorly its environmental consequences. Yet, this does not necessarily mean that the perceived poor environmental consequences caused the lack of support for renewable energy. Rather, there could be a halo effect involved: people may evaluate the environmental consequences of renewable energy as poor *because* they do not generally evaluate renewable energy positively in relation to their goals. Indeed, our results reported in Chapter 5 showed that negative attitudes towards renewable energy and poor evaluations of its environmental consequences were most prominent among people with strong egoistic values. People with strong egoistic values rated the consequences of energy alternatives for consumers' resources, rather than consequences for the environment, as particularly important. Thus, it seems that particularly the individual consequences of renewable energy (e.g. price) caused the negative attitude towards this energy alternative among people with strong egoistic values. This overall value-based attitude could have in turn led to their poor evaluation of environmental consequences of renewable energy.

Overall, the results of the current studies provide substantial support for the proposed conceptual framework, which, in turn, generates important implications for explaining evaluations of sustainable products. Evidently, people evaluate sustainable products based on how well, they think, these products facilitate their goals. The relative strength of goals in a situation depends on situational cues and individual values. For explaining evaluations of sustainable products, it is important to take the dynamics of goals

and differences in their chronic activation into account, on the basis of a consistent framework integrating goal theory and value theory.

6.2. Theoretical implications and directions for future research

The proposed conceptual framework and the results reported in this PhD thesis have some wider theoretical implications that exceed the discussed specific implications for explaining evaluations of sustainable products. Below, we first discuss implications of our findings for goal theory. Next, we elaborate on implications for value theory.

6.2.1. Implications for goal theory

It has been found over and again that situational cues associated with specific goals prime these goals (Bargh, 2006; Bargh et al., 2001; Kruglanksi, 2002). Our results extend these findings by showing that goal effects occur irrespective of purely semantic associations that may be triggered by the same cues. The phenomenon of parallel priming has important implications for goal theory. It implies that semantic and goal priming effects, although different, are not mutually exclusive. For example, if semantic priming effects are observed after a prime, it does not necessarily mean that goals were not primed. Indeed, our results suggest that goal priming effects could be elicited by the same prime and in the same person, and show up if explicitly sought for. In fact, if thoroughly measured, parallel priming effects may turn out to be more common than generally assumed. To test the robustness of the current findings, future research designed to capture both semantic and goal priming effects is needed. One question that could be addressed in future research is how strong primes should be in order to yield goal priming effects, next to purely semantic priming effects. Goal framing theory suggests that this might depend on the type of goals: the overarching hedonic goal is a priori the strongest and needs less support from situational cues than the gain and, especially, the normative goal (Lindenberg & Steg,

2007). In support of this theorising, we found that while a hedonic prime by itself yielded the expected goal priming effects, an excellence prime needed to be reinforced by a goal-supporting situation in order for the goal priming effects to show up (Chapter 2). The current studies, however, were not designed to systematically compare the strength of cues needed to prime hedonic, gain, and normative goals. Future research is needed to address this question.

We introduced the concept of chronically activated overarching goals (i.e. values), which is an important extension of goal theory. So far, the focus in goal theory has been mostly on what specific goals people pursue (e.g. to achieve academic success or to lose weight; Kruglanski et al., 2002; to be an egalitarian person; Moskowitz, Gollwitzer, Wasel, & Schall, 1999; Moskowitz, Salomon, & Taylor, 2000), and how these goals can be primed in a situation. Overarching goals, on the other hand, contain collections of sub-goals (e.g. achieving academic success and losing weight are sub-goals of the gain goal, being an egalitarian person is a sub-goal of the normative goal) and can thus affect what sort of goals become strong in many different situations. We define values as chronically activated overarching goals. Values are therefore interesting for goal theory. Although we may not know people's specific goals in a given situation, information about their values can inform us which aspects in the situation people will attend to most for their goal-driven evaluations. Indeed, we found that people's values guided their evaluations of various sustainable products, specifically food products (Chapter 3) and energy alternatives (Chapters 4 and 5). When exposed to the same energy alternatives, people attended to different characteristics of these alternatives and evaluated them differently, depending on their values (Chapter 4). Furthermore, our results suggest that values can determine the relative strength of goals in a situation even when explicit goal-relevant cues are not there. Specifically, merely an exposure to pro-environmental food products elicited more positive

evaluations among people with strong (versus weak) biospheric values (provided that these products were seen as facilitating pro-environmental goals), while an explicit environmental prime had no additional influence on this relationship (Chapter 3). Thus, if a goal prime does not yield priming effects, this does not necessarily mean that goals are not strong. Strongly chronically activated goals (i.e. important values) and the corresponding sub-goals can be primed by subtle cues like the products as such and already guide evaluations, with the explicit prime having no additional effect. We do not mean to say, however, that explicit value primes are never needed to increase goal strength, provided that values are strong. For example, in one study, biospheric values had to be explicitly primed in order to yield goal-driven evaluations of television sets, for which environmental aspects were provided in one list with many other aspects, such as screen quality (Verplanken & Holland, 2012). Making other aspects salient could have primed competing (e.g. gain) goals and made the explicit prime necessary for strengthening normative (pro-environmental) goals. Future studies could explore in more detail the conditions under which explicit cues are needed for values to yield goal effects on evaluations.

Goal theory mostly focuses on what goals people have and how that affects their overall evaluations of products. The current reasoning and findings introduce an important subsequent step, namely that people use these overall goal-based evaluations to derive evaluations of specific product characteristics that may have little to do with their goals (Chapters 3 and 5). Thus, goal effects may spread wider than often anticipated, due to a halo effect of the goal-based valence. Given that we studied correlations between goals, particularly values, and evaluations, we cannot draw definite conclusions about the sequence of effects form goals to an overall goal-based evaluation and to (haloed) evaluations of various product characteristics. Future experiments need to test these causal inferences. For example, it would be interesting to see whether people evaluate various

product characteristics differently when different goals are primed, even if the evaluated characteristics are not directly relevant to these goals.

6.2.2. Implications for value theory

Although values have been conceptualized as general overarching goals (Hitlin & Piliavin, 2004; Schwartz, 1992; 1994), they have hardly been studied as such. Taking goal qualities into account can help better understand the effects of values on evaluations, as explained below.

It has been shown that value-relevant cues (e.g. value-related words) can activate values and elicit their influence on subsequent evaluations and behaviour (Hoogland et al., 2005; Maio, 2010; Maio et al., 2001; Maio et al., 2009; Verplanlen & Holland, 2002). We build on these findings and propose that such explicit cues may not be necessary and that subtle cues in a given situation can already activate values. We base this on the definition of chronic goal activation: goals that are strongly chronically activated (i.e. important values) probably do not need strong primes for increased activation (given there are no strong conflicting primes). We indeed found that subtle primes like products as such, specifically pro-environmental food products (Chapter 3) and energy alternatives (Chapters 4 and 5), could activate values and yield goal-driven evaluations. In this thesis, we used common priming procedures (i.e. the scrambled word sentences task; Srull & Wyer 1979) as explicit primes, whereas we used a mere exposure to sustainable products as subtle primes. Future studies could look into additional criteria for defining the strength of primes, that is, how explicit or subtle they are (e.g. subliminal versus supraliminal priming, the duration of exposure to priming, the absence versus presence of conflicting primes). Next, it is important to study how strong (on various criteria) primes need to be in order for values to yield goal effects on evaluations.

The current results indicate that the effects of values on product evaluations depend on how well the product fulfils one's value-based prominent goals. Looking at overarching goals helped us explain what implications people expect from different products for their specific goals in a situation. For example, virtue products, which generally fulfil the overarching normative goal, were seen by our participants as better facilitating pro-environmental goals that vice products, which generally fulfil the overarching hedonic goal (Chapter 3). And indeed, even when both were described as sustainable, only virtue products but not vice products could trigger positive evaluations among people with strong biospheric values (Chapter 3). Value theory does not take the dynamics of overarching goals into account and does not differentiate between the effects of values on evaluations of different types of sustainable products. By taking goals into account we could explain why biospheric values lead to positive evaluations of some (i.e. virtue) but not other (i.e. vice) sustainable products. Furthermore, we showed that, although both promoted as (relatively) sustainable, different energy alternatives (i.e. nuclear and renewable energy) elicited different evaluations, depending on the implications of these alternatives for people's value-based prominent goals (Chapters 4 and 5). More studies are needed to see whether our results can be replicated for different products. For example, other energy alternatives, such as natural gas and currently widely debated shale gas, have been promoted as (relatively) sustainable. It is important to study what consequences people expect from these energy alternatives for their value-based prominent goals and how that affects their evaluations of these energy alternatives.

Value theory has mostly focused on how people prioritize different values and how that affects their overall product evaluations. The current findings extend this knowledge by showing that people may evaluate many product characteristics in line with their value-based judgement, even if these characteristics are not particularly important to them in the

light of their values (Chapters 3 and 5). Thus, the effects of values on evaluations may be more far reaching than generally assumed. We reason that people base their overall product evaluation on the product characteristics that have implications for their value-based prominent goals. Then, people may derive their evaluations of other products characteristics in a way that supports their overall value-based evaluation. However, given the correlational nature of our results, we cannot conclude whether these haloed evaluations can contribute to, or are merely a result of, the overall value-based product evaluation. Future research is needed to address this question. Another important topic for future research is to study how value-driven evaluations of various product characteristics, including the possible haloed evaluations, influence actual product choice.

6.3. Practical implications

We argued and demonstrated in this PhD thesis that people evaluate products based on how well, they think, these products facilitate their goals, and that the relative strength of goals in a situation depends on situational cues and people's values. Sustainable products are aimed at decreasing the negative environmental impact of our consumption, but at the same time they may imply some immediate costs to consumers, such as expensiveness or inconvenience. Accordingly, sustainable products are more likely to be evaluated positively when people have strong normative, particularly pro-environmental, goals (as long as these products are seen as facilitating these goals). In contrast, sustainable products are less likely to be evaluated positively if people have strong hedonic or gain goals, unless these products are believed to facilitate particularly these goals. So, in order to enhance positive evaluations of sustainable products, people's pro-environmental goals need to be strengthened. But how can we realise this? We propose that interventions should target the two key factors that determine the strength of goals in a situation: situational cues and values, as explained below.

In order to strengthen pro-environmental goals, one needs to increase the salience of situational cues that prime normative goals and decrease the salience of situational cues that prime the competing hedonic and gain goals (Steg, Bolderdijk, Keizer, & Perlaviciute, in press). In practice, other than pro-environmental appeals are often used to promote sustainable products. For example, pro-environmental food products are promoted as tasty, or it is argued that using renewable energy will eventually cut one's energy bill. Such appeals speak to people's hedonic and gain goals and can thus strengthen particularly these types of goals in a situation. Hedonic and gain goals may lead to positive evaluations of specific sustainable products if these products are seen as facilitating these goals, for example, if they are perceived as tasty and/or relatively cheap. However, hedonic and gain goals will probably cease to enhance positive evaluations of sustainable products as soon as the direct benefits of these products to consumers decrease (e.g. a product becomes more expensive). Next, hedonic and gain goals will probably not guarantee positive evaluations of many different sustainable products, since many of these products imply immediate costs to consumers. Normative (pro-environmental) goals, on the other hand, may have more consistent and far reaching positive effects on evaluations of sustainable products. Specifically, people with strong pro-environmental goals may favour products that facilitate these goals, and be less influenced by other product qualities, such as taste and price. In order to strengthen people's normative pro-environmental goals, sustainable products should be promoted on the basis of their environmental and societal impact as well. Besides the promotion claims, other situational cues can influence the relative strength of goals. For example, severe barriers for adopting sustainable products (e.g. big price differences between conventional and sustainable products) could favour the activation of the overarching gain goal in relation to the normative goal. One can decrease the salience of gain cues by removing such barriers. To further increase the salience of

normative cues, sustainable products could be promoted as “good for the environment” rather than “lowered in price”.

Pro-environmental goals are more likely to become strong in a situation if people strongly endorse biospheric values. The influence of biospheric values on product evaluations is rarely considered in practice, whereas the results reported in this PhD thesis clearly demonstrate the importance of it. First, we found that strong biospheric values enhance positive evaluations of sustainable products (provided that these products are seen as facilitating pro-environmental goals) even without explicit pro-environmental cues (Chapters 3, 4, and 5). Next, our results indicate that if sustainable products, for example renewable energy, are seen as having disadvantages for consumers’ resources, people with strong biospheric values nevertheless evaluate these products relatively positively, including the consequences for consumer’s resources (Chapter 5). Thus, biospheric values may lead to consistent positive evaluations of many different sustainable products. But how can we increase the influence of biospheric values on product evaluations?

Values are chronically activated overarching goals, but their relative activation in a situation can be decreased or increased by situational cues. The financial and tastiness appeals mentioned above will activate hedonic and egoistic values, whereas the environmental appeals will activate biospheric values. In fact, emphasizing the effects of products on nature and the environment can turn many of these products into cues activating particularly biospheric values. This is particularly relevant when introducing new (sustainable) products, for example, new sources of renewable energy. This way, environmental cues can be created in society.

This relates to another important question, namely whether and how the relative strength of values can be changed. Although values are considered to be relatively stable,

there is some evidence that the relative importance of values can change, for example, due to critical life events like moving to a different culture (Lönnqvist, Jasinskaja-Lahti, & Verkasalo, 2011; for a review see Bardi & Goodwin, 2011). Probably, biospheric values can get stronger in time if new environmental cues are constantly created and made salient in society; future research is needed to test this plausibility. Bringing up environmental problems and their detrimental effects for our way of living in scientific arena and in public debate, as well as looking for and discussing the potential solutions to these problems, could strengthen biospheric values (Lindenberg & Steg, 2013b). However, empirical research into value change is rare and does not yet allow for definite conclusions. Given the importance of biospheric values for evaluations of sustainable products, as demonstrated in this PhD thesis, we consider it necessary for future (longitudinal) studies to look into possibilities to strengthen these values.

We found that not all products that are promoted as sustainable will be evaluated positively, despite people's strong pro-environmental goals. This is because not all products are seen as facilitating pro-environmental goals. For example, promoting virtue food products as sustainable can be effective, as it draws people's attention to the environmental product qualities, which are rated excellently for these products. In contrast, promoting vice food products as sustainable might be less effective or even counterproductive, as it makes people focus on the environmental qualities of products that are not seen as very environmentally-friendly. One option here is, instead of sustainability claims, to use claims that strengthen "fitting" (i.e. hedonic) goals for such vice products by, say, promoting them as "yummy". However, as explained earlier, hedonic or gain goals will only enhance positive evaluations of specific sustainable products that facilitate these goals, but these positive effects will vanish when the product benefits decrease or given other sustainable products that imply immediate costs to consumers. An important question

is whether it is possible to increase the perceived "fit" between normative (pro-environmental) goals and sustainable vice products. Possibly, the "normative" image of vice products can be strengthened if normative cues are constantly made salient for these products. For example, chocolate is often labelled as "Fair-Trade" in the Netherlands, which could enhance the "normative" image of chocolate in the long run. Would ("Fair-Trade") chocolate, if described as sustainable, be seen as relatively environmentally-friendly and hence evaluated relatively positively by people with strong pro-environmental goals? The current studies cannot answer this question; future research needs to address it.

While it is important to understand what implications for their goals people expect from various products, this might not be directly evident from people's evaluations of these products. Our results suggest that people may hold "haloed" evaluations of various product characteristics. That is, they may evaluate certain product characteristics in line with their overall goal-based evaluation of a product, even if these characteristics are not particularly important to them. For example, people with strong biospheric values may evaluate sustainable virtue products as tasty and sustainable vice products as not that tasty. This, however, might have little to do with the actual taste of products. Instead, the extent to which virtue and vice products are seen as facilitating pro-environmental goals could drive evaluations of tastiness. Importantly, trying to improve the taste of vice products might not have the expected positive effect on evaluation, given that a normative (pro-environmental) goal rather than a hedonic goal drove evaluation in the first place. Next, we found that less favourable attitude towards renewable energy and poor evaluation of its environmental consequences were most prominent among people with strong egoistic values, who in fact rated individual rather than environmental consequences of energy alternatives as very important. These people seem to have derived their poor environmental evaluation from their general negative attitude towards renewable energy. Trying to convince them that

renewable energy has environmental benefits is not likely to change their evaluation, as long as renewable energy is seen as having disadvantages to consumers, such as expensiveness or inconvenience. We propose that taking goals, particularly values, into account can help practitioners understand what "truly" drives evaluations of sustainable products. Knowing that, one could try and alter sustainable products so that they have more positive and less negative consequences for people's prominent goals. It is important to consider, however, that making sustainable products compatible with people's hedonic and gain goals (e.g. lowering the price, making energy technology more user-friendly) will probably only enhance evaluations of these specific products but not of other sustainable products. Furthermore, sometimes certain immediate costs of sustainable products cannot be excluded. In order to ensure consistent and far reaching positive effects on evaluations of various sustainable products, practitioners should aim for continuously strengthening people's pro-environmental goals, as explained above.

6.4. Conclusion

We argued and showed in this PhD thesis that evaluations of sustainable products are goal-driven. Sustainable products are evaluated positively if people have strong pro-environmental goals and if these products are seen as enabling one to pursue these goals. Pro-environmental goals are more likely to be prominent for people with strong biospheric values. Merely an exposure to sustainable products can already prime their pro-environmental goals, yielding goal-driven evaluations of these products. Interestingly, however, the same sustainable products can also prime other goals, such as a gain goal to save money or a hedonic goal to enjoy comfort, if people have strong egoistic or hedonic values, respectively. Sustainable products are then evaluated based on how well they facilitate these other goals, for example how expensive or convenient they are. Therefore, sustainable products can be evaluated differently for different reasons. Taking goals,

particularly values, into account helps us explain what “truly” drives evaluations of sustainable products, as well as which evaluations are merely under a halo effect and do not necessarily reflect what is most important to people. We hope that this PhD thesis will inspire future research into evaluations of sustainable products, based on a consistent framework integrating goal theory and value theory. Better understanding of the goal dynamics behind evaluations of sustainable products can inform future practices aimed at enhancing positive evaluations and support for these products.

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DUTCH SUMMARY

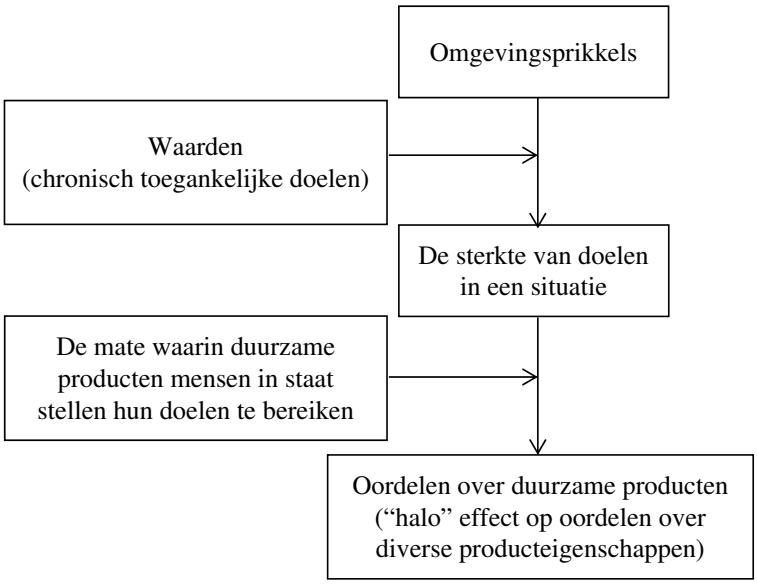
NEDERLANDSE SAMENVATTING

Introductie

Milieuproblemen zijn een grote zorg in onze samenleving. Deze worden voor een groot deel veroorzaakt door het gedrag van mensen, bijvoorbeeld door voedsel en het verbruik van energie (IPCC, 2013; OECD, 2012). Om de milieuproblemen te verminderen zijn er verschillende duurzame producten ontwikkeld. Met "duurzame producten" bedoelen wij producten die, volgens hun beschrijving, (relatief) weinig invloed op het milieu hebben. Sommige levensmiddelen of energiebronnen worden bijvoorbeeld gepresenteerd als (relatief) duurzaam. Maar hoe beoordelen mensen duurzame producten, en welke factoren spelen daarbij een rol?

In dit proefschrift gaan we na hoe doelen van mensen hun oordelen over duurzame producten beïnvloeden. Ons basisidee is dat mensen duurzame producten positief beoordelen wanneer deze producten hen in staat stellen om hun doelen te bereiken, terwijl ze deze producten niet positief (of zelfs negatief) beoordelen wanneer deze producten hen niet in staat stellen hun doelen te bereiken. De doelframing theorie (Lindenberg & Steg, 2007; 2013a) veronderstelt dat drie overkoepelende doelen van belang zijn voor beoordeling van duurzame producten, namelijk het hedonische doel, winstdoel, en normatieve doel. Het hedonische doel is gericht op het zich goed te voelen, plezier te hebben, en moeite te besparen. Het winstdoel motiveert om eigen hulpboren zoals geld, status, en tijd veilig te stellen of te vergroten. Het normatieve doel is gefocust op het juiste te doen en handelen in een overeenstemming met morele normen. Deze drie overkoepelende doelen kunnen in verschillende mate actief zijn in een bepaalde situatie. Het overkoepelende doel dat in een situatie het meest actief is, is toonaangevend voor de specifieke doelen in een situatie. Deze specifieke doelen zullen vervolgens oordelen over duurzame producten beïnvloeden.

Duurzame producten hebben als doel om milieuproblemen te verminderen. Daarom worden deze producten waarschijnlijk positief beoordeeld door mensen met sterke normatieve doelen, zoals een doel om het milieu te beschermen. Maar duurzame producten brengen vaak (korte-termijn) kosten met zich mee (bijv. hoge prijs, ongemak). Daarom worden deze producten waarschijnlijk minder positief (of zelfs negatief) beoordeeld door mensen met sterke hedonische doelen (zoals plezier beleven) of winstdoelen (zoals geld besparen). Maar welke factoren bepalen de sterkte van verschillende doelen in een situatie? En hoe beïnvloeden deze doelen de oordelen over duurzame producten? Om deze vragen te beantwoorden, hebben we een conceptueel model ontwikkeld (Figuur 1). Dit model is gebaseerd op doeltheorieën en waardentheorieën. Volgens het model bepalen twee belangrijke factoren de sterkte van doelen in een situatie, namelijk omgevingsstimuli en waarden. Vervolgens verklaart het model hoe doelen de oordelen over duurzame producten beïnvloeden. Ten eerste hangt deze beoordeling af van de mate waarin deze producten mensen in staat stellen om hun doelen te bereiken. Ten tweede kan de valentie (positief of negatief) van deze beoordeling een “halo” effect veroorzaken en daarmee de oordelen over verschillende producteigenschappen beïnvloeden, zelfs als deze eigenschappen niet relevant zijn voor belangrijke doelen van een individu op dat moment. We hebben ons conceptueel model in verschillende studies getest: in experimentele studies, een literatuuranalyse, en correlationele studies.



Figuur 1. De invloed van doelen op oordelen over duurzame producten.

Factoren die de sterkte van doelen in een situatie bepalen

Omgevingsprikkels

De sterkte van doelen in een situatie wordt ten eerste bepaald door prikkels vanuit de omgeving. Maar dezelfde prikkels kunnen ook semantische associaties oproepen, die eveneens oordelen over duurzame producten kunnen beïnvloeden. Deze semantische associaties hebben echter niets met doelen te maken en hebben alleen op korte-termijn effect op oordelen (Förster, Liberman, & Friedman, 2007). We onderzochten of omgevingsprikkels naast semantische associaties ook doelen kunnen activeren of versterken, die op langere-termijn effecten op oordelen zou kunnen hebben (Hoofdstuk 2). Uit onze resultaten is gebleken dat een omgevingsprikkel inderdaad bij dezelfde persoon zowel semantische als doeleffecten kan hebben. Na blootstelling aan een experimentele prikkel gerelateerd aan hedonisme of een goede prestatie, beoordeelden mensen een

persoon meer in de richting van die prikkel. Dit effect moet het gevolg zijn van geactiveerde semantische associaties, omdat mensen hun doelen niet konden bereiken door de persoon in de richting van de prikkel te beoordelen. Zoals verwacht, was dit effect van korte duur. Vervolgens hebben we bij dezelfde mensen doeleffecten gevonden. Na blootstelling aan een experimentele prikkel streefden mensen meer naar het vervullen van doelen die gerelateerd waren aan de prikkel, en maakten ze andere keuzes of vertoonden ze ander gedrag. Zoals verwacht, was dit effect van langere duur.

Het onderscheid tussen semantische associaties en doelen is belangrijk voor het begrijpen van oordelen over duurzame producten. Vaak wordt het verwacht dat mensen duurzame producten positief zullen beoordelen omdat ze "groen" met "goed" associëren. De veronderstelling is dat deze semantische associatie voor iedereen en voor alle producten hetzelfde is. Maar zelfs als dergelijke associatie tussen "groen" en "goed" bestaat, moet deze eerst geactiveerd worden in een situatie om oordelen over duurzame producten te beïnvloeden. Bovendien kan het effect van deze associatie alleen maar van korte duur zijn. Onze resultaten laten zien dat naast semantische associaties ook doelen kunnen worden geactiveerd of versterkt door omgevingsprikkels. In dit proefschrift laten we verder zien dat, anders dan bij semantische effecten, doeleffecten afhankelijk zijn van waarden van mensen en van kenmerken van de beoordeelde producten zelf.

Waarden

Waarden zijn de tweede factor in ons model die de sterkte van doelen in een situatie bepaalt. Waarden zijn algemene doelen die mensen belangrijk vinden in hun leven (Schwartz, 1992). Vier typen waarden zijn van belang voor de verklaring van duurzame opvattingen en gedrag: hedonische waarden (veel belang in plezier hebben en zich goed voelen), egoïstische waarden (veel belang in het versterken van eigen hulpbronnen),

altruïstische waarden (veel belang in het bevorderen van het welzijn van anderen), en biosferische waarden (veel belang in de kwaliteit van natuur en het milieu; Steg, Perlaviciute, Van der Werff, & Lurvink, in press). Deze waarden sluiten aan bij de drie overkoepelende doelen die we eerder bespraken: hedonische en egoïstische waarden hebben dezelfde focus als het hedonische doel en het winstdoel, terwijl altruïstische en biosferische waarden gerelateerd zijn aan het normatieve doel. Wij integreren dus doeltheorieën en waardentheorieën en definiëren waarden als chronisch toegankelijke overkoepelende doelen. Overkoepelende doelen die chronisch toegankelijk zijn (ofwel belangrijke waarden) kunnen in een situatie makkelijker domineren en specifieke doelen bepalen.

Waarden maken mensen gevoelig voor bepaalde prikkels en omgekeerd laat onderzoek zien dat prikkels daarbij horende waarden kunnen activeren en daarmee de invloed van die waarden op opvattingen en gedrag versterken (Evans et al., 2013; Maio, Olson, Allen, & Bernard, 2001; Maio, Pakizeh, Cheung, & Rees, 2009). Deze effecten zijn sterker naarmate mensen de waarden belangrijker vinden (Hoogland, De Boer, Boersema, 2005; Verplanken & Holland, 2002). Wanneer waarden sterk zijn, zijn expliciete prikkels waarschijnlijk niet nodig om deze waarden te activeren en doelen te versterken, omdat ze al chronisch geactiveerd zijn. Omdat duurzame producten gerelateerd zijn aan milieudoelen, kunnen ze waarschijnlijk deze doelen versterken, vooral als mensen sterke biosferische waarden hebben. We hebben inderdaad gevonden dat mensen met sterke biosferische waarden duurzame levensmiddelen positief beoordeelden als het duidelijk was dat deze producten hen in staat stellen milieudoelen doelen te bereiken (Hoofdstuk 3). Een expliciet milieu-gerelateerde prikkel had geen additioneel effect op de relatie tussen waarden en de beoordeling van duurzame levensmiddelen. Dit betekent dat duurzame producten zelf al als een subtiele omgevingsprikkel werkten, die milieudoelen voor mensen

met sterke biosferische waarden versterkten, waardoor deze doelen sterkere invloed hadden op oordelen over duurzame producten.

De interactie tussen omgevingsprikkels en waarden

Duurzame producten kunnen niet alleen invloed op de sterkte van milieudoelen maar ook op de sterkte van hedonische doelen en winstdoelen hebben, indien mensen sterke hedonische of egoïstische waarden hebben. Dat zou betekenen dat mensen met verschillende waarden dezelfde duurzame producten anders kunnen beoordelen, op basis van de gevolgen van deze producten voor de op hun waarden gebaseerde doelen. Om dit te onderzoeken, gingen wij na welke relatie waarden hebben met oordelen over verschillende energiebronnen. Energiebronnen hebben diverse kenmerken (bijv. het effect op het milieu, prijs) die aan verschillende doelen voldoen (bijv. milieu beschermen, geld besparen). Wij verwachtten dat mensen vooral de gevolgen voor hun doelen die gerelateerd zijn aan hun belangrijke waarden in overweging zouden nemen wanneer ze energiebronnen beoordelen. Onze literatuuranalyse biedt ondersteuning voor deze hypothese (Hoofdstuk 4). Mensen oordelen vooral positief over energiebronnen die positieve gevolgen hebben voor doelen die gerelateerd zijn aan hun belangrijke waarden. Daarentegen oordelen mensen minder positief (of zelfs negatief) over energiebronnen die geen positieve of zelfs negatieve gevolgen hebben voor doelen die gerelateerd zijn aan hun belangrijke waarden.

Vervolgens gingen wij in twee empirische studies na hoe waarden gerelateerd zijn aan oordelen over kernenergie en hernieuwbare energie (Hoofdstuk 5). Beide energiebronnen worden als duurzaam gepresenteerd, maar men associeert ze met verschillende gevolgen voor normatieve doelen (zoals milieudoelen) en winstdoelen, zo blijkt uit onze literatuuranalyse (Hoofdstuk 4). Over het algemeen verwachten mensen dat kernenergie risico's met zich mee brengt voor het milieu maar tegelijkertijd zien ze de

voordelen van kernenergie voor de consument (bijv. lage prijs). Daarentegen denken mensen dat hernieuwbare energie goed voor het milieu is maar tegelijkertijd nadelen heeft voor de consument (bijv. hoge prijs). Wij gingen na of waarden samenhangen met hoe mensen deze energiebronnen beoordelen. Wij vonden dat, zoals verwacht, mensen met sterke egoïstische waarden vooral individuele gevolgen (bijv. prijs) van energiebronnen belangrijk vonden. Mensen met sterke biosferische waarden vonden daarentegen vooral de gevolgen voor het milieu belangrijk. Het belang dat men hecht aan gevolgen van energiebronnen heeft vervolgens de oordelen over energiebronnen beïnvloed. Mensen met sterkere egoïstische waarden beoordeelden kernenergie meer positief dan mensen met zwakkere egoïstische waarden (zowel in het algemeen als de specifieke gevolgen van kernenergie), terwijl ze hernieuwbare energie minder positief beoordeelden. Het tegenovergestelde was waar voor mensen met sterke biosferische waarden. Mensen met sterkere biosferische waarden beoordeelden kernenergie minder positief terwijl ze hernieuwbare energie positiever beoordeelden dan mensen met zwakkere biosferische waarden. Mensen beoordelen energiebronnen dus op basis van de gevolgen die deze energiebronnen hebben voor hun waarden, en de daaruit afgeleide doelen.

Hieruit blijkt dat het belangrijk is om rekening te houden met welke doelen mensen nastreven, om te begrijpen hoe ze oordelen over duurzame producten. Zonder kennis over doelen en vooral waarden wordt niet duidelijk waarom verschillende mensen dezelfde duurzame producten anders beoordelen.

De effecten van doelen op oordelen over duurzame producten

De sterkte van doelen in een situatie wordt dus bepaald door omgevingsprikkels en waarden van mensen. Maar hoe beïnvloeden doelen de oordelen over duurzame producten? Volgens ons model hangt de beoordeling af van de mate waarin duurzame producten

mensen in staat stellen hun doelen te bereiken. Vervolgens kan de valentie van deze beoordeling een "halo" effect veroorzaken en daarmee de oordelen over verschillende producteigenschappen kleuren. Dit "halo" effect kan zelfs invloed hebben op oordelen over producteigenschappen die niet relevant zijn voor de doelen die een individu op dat moment heeft.

De mate waarin duurzame producten mensen in staat stellen hun doelen te bereiken

Wij denken dat mensen duurzame producten positief beoordelen wanneer deze producten hen in staat stellen om hun doelen te bereiken, terwijl zij deze producten niet positief (of zelfs negatief) beoordelen wanneer deze producten hen niet in staat stellen om hun doelen te bereiken. Onze bevindingen ondersteunen deze veronderstelling. Ten eerste vonden wij dat de invloed van biosferische waarden op de oordelen over duurzame levensmiddelen verschilde voor verschillende soorten producten (Hoofdstuk 3). Duurzame levensmiddelen die vooral aan het normatief doel voldoen (zogenaamde "normatieve" producten) werden positiever beoordeeld door mensen naarmate men sterkere biosferische waarden had. Biosferische waarden hingen daarentegen niet samen met oordelen over zogenaamde "hedonische" levensmiddelen, die voornamelijk aan het hedonische doel voldoen. Mensen met sterke biosferische waarden beoordeelden duurzame levensmiddelen dus alleen positiever wanneer het duidelijk was dat deze producten hen in staat stellen om hun normatieve (in dit geval milieu) doelen te behalen. Ten tweede hebben we zowel in de literatuur (Hoofdstuk 4) als in de empirische studies (Hoofdstuk 5) gevonden dat mensen dezelfde energiebronnen verschillend beoordelen, op basis van de gevolgen van deze energiebronnen voor hun waarden en de daaruit afgeleide doelen. Deze resultaten suggereren dat oordelen over duurzame producten afhankelijk zijn van de mate waarin deze producten mensen in staat stellen hun doelen (die afhankelijk zijn van hun waarden) te bereiken.

Onze resultaten suggereren dat niet alle producten die gepresenteerd worden als duurzaam positief beoordeeld zullen worden, zelfs niet door mensen met sterke milieudoelen. Mensen zullen deze producten vooral positief beoordelen als ze denken dat de duurzame producten hen in staat stellen om hun milieudoelen te bereiken. Daarnaast kunnen duurzame producten andere doelen activeren of versterken, zoals hedonische doelen en winstdoelen, afhankelijk van de waarden van mensen. Duurzame producten worden vervolgens beoordeeld op basis van de mate waarin ze mensen in staat stellen deze andere doelen te bereiken.

Het "halo" effect

Volgens ons model kunnen doelen van mensen ook oordelen over diverse specifieke producteigenschappen beïnvloeden, ook al zijn deze eigenschappen niet relevant voor de doelen die een individu op dat moment heeft. Onze resultaten ondersteunen dit zogenaamde "halo" effect. Wij vonden dat mensen met sterke biosferische waarden diverse eigenschappen van duurzame levensmiddelen positiever beoordeelden, waaronder ook eigenschappen die niet direct relevant waren voor hun milieudoelen (Hoofdstuk 3). Dit suggereert dat mensen eerst nagaan welke gevolgen duurzame producten hebben voor hun belangrijke doelen, en op basis daarvan een algemeen indruk van deze producten vormen. Vervolgens kan deze algemene indruk de oordelen over diverse producteigenschappen kleuren: als een product positief wordt beoordeeld in het licht van iemands doelen en waarden, zal het product op allerlei aspecten positief worden beoordeeld (en omgekeerd).

Wij vonden dit "halo" effect ook bij de beoordeling van energiebronnen. De waarden van mensen bepaalden hoe waarschijnlijk ze de verschillende gevolgen van energiebronnen vonden. Mensen schreven meer positieve gevolgen toe aan energiebronnen die hen in staat stelden hun waarden en daaruit afgeleide doelen te vervullen, ook al waren

deze gevolgen niet heel belangrijk voor hen gezien hun waarden. Daarentegen schreven ze minder positieve gevolgen toe aan energiebronnen die hen niet in staat stelden om hun waarden en de daarmee samenhangende doelen te bereiken.

Dit type "halo" effecten is belangrijk voor het begrijpen van oordelen over duurzame producten. Mensen kunnen bijvoorbeeld weinig steun voor hernieuwbare energie tonen en (daarom) de gevolgen van hernieuwbare energie voor het milieu minder positief beoordelen. Maar dat betekent nog niet dat de minder positieve oordelen over de milieueffecten van hernieuwbare energiebronnen een reden zijn voor weinig steun voor hernieuwbare energie; het lijkt er eerder een gevolg van te zijn. Wij vonden dat vooral mensen met sterke egoïstische waarden hernieuwbare energie minder positief beoordeelden, zowel in het algemeen als de milieueffecten ervan (Hoofdstuk 5). Mensen met sterke egoïstische waarden vonden echter vooral de individuele gevolgen van energiebronnen belangrijk, terwijl ze de gevolgen voor het milieu niet zo belangrijk vonden. Dit suggereert dat mensen met sterke egoïstische waarden hernieuwbare energie minder positief beoordelen vanwege de nadelen van hernieuwbare energie voor de consument (bijv. hoge prijs). Vervolgens kleurt deze beoordeling hun oordelen over andere eigenschappen van hernieuwbare energie, bijvoorbeeld de milieueffecten ervan.

Theoretische implicaties

Ons conceptueel model en de resultaten van dit proefschrift hebben implicaties voor zowel doeltheorieën als waardentheorieën. Deze zullen we hierna bespreken.

Implicaties voor doeltheorieën

Uit de resultaten blijkt dat dezelfde omgevingsprikkels tegelijkertijd semantische associaties kunnen oproepen en doelen kunnen activeren of versterken (Hoofdstuk 2). Dit suggereert dat als semantische associaties door een (experimentele) omgevingsprikkel

worden geactiveerd, dat niet betekent dat er geen doeleffecten optreden. Doeleffecten kunnen naast (en na) semantische effecten plaatsvinden, indien ze expliciet gemeten worden in een experiment. Vervolgonderzoek is nodig om na te gaan of onze resultaten gerepliceerd kunnen worden met andere omgevingsprikkels en in andere situaties. Daarbij is het interessant om te onderzoeken hoe sterk de omgevingsprikkels moeten zijn om doelen te versterken. De doelframing theorie veronderstelt dat het hedonische doel a priori het sterkst is en dus geen sterke omgevingsprikkels behoeft om dominant te worden in een situatie, terwijl het winstdoel en vooral het normatieve doel a priori relatief zwakker zijn (Lindenberg & Steg, 2007; 2013), waardoor wellicht sterkere omgevingsprikkels nodig zijn om deze doelen te versterken. Vervolgonderzoek is nodig om na te gaan hoe sterk omgevingsprikkels moeten zijn om hedonische doelen, winstdoelen, en normatieve doelen te versterken.

Onze resultaten suggereren dat doeltheorieën rekening moeten houden met de chronisch toegankelijkheid van overkoepelende doelen (ofwel waarden). Overkoepelende doelen bepalen de sterkte van meer specifieke doelen in een situatie. Wij definiëren waarden als chronisch toegankelijke overkoepelende doelen. Op basis van waarden kunnen voorspellingen worden gedaan over welke aspecten in een bepaalde situatie voor mensen het belangrijkst zullen zijn en hoe ze vervolgens producten zullen beoordelen, zonder dat daarbij alle specifieke doelen in beschouwing hoeven te worden genomen. Oordelen over verschillende producten zoals bijvoorbeeld levensmiddelen (Hoofdstuk 3) en energiebronnen (Hoofdstuk 4 en 5) bleken afhankelijk te zijn van waarden van mensen. Wij vonden zelfs dat dezelfde energiebronnen verschillend werden beoordeeld door mensen, op basis van hun waarden. Uit onze resultaten blijkt dat bij mensen met sterke waarden doelen kunnen worden versterkt zonder dat daar expliciete prikkels voor nodig zijn. Mensen met sterke biosferische waarden beoordeelden bijvoorbeeld duurzame

levensmiddelen positief (zolang het duidelijk was dat deze producten hen in staat stelde om hun milieudoelen te bereiken), terwijl een expliciet milieu-gerelateerde prikkel geen additioneel effect had op de relatie tussen waarden en deze oordelen (Hoofdstuk 3). Dit suggereert dat als een experimentele prikkel geen doeleffecten veroorzaakt, dat niet betekent dat doelen niet actief zijn. Als overkoepelende doelen chronisch toegankelijk zijn (omdat ze belangrijke waarden vertegenwoordigen), kunnen situatie-specifieke doelen worden versterkt door subtiele prikkels zoals duurzame producten, en daarmee oordelen beïnvloeden. Dit betekent echter niet dat expliciete prikkels nooit nodig zijn om waarden te activeren en doelen te versterken. Als er bijvoorbeeld andere sterke omgevingsprikkels zijn die andere doelen activeren of versterken (zoals het hedonische doel of winstdoel), zou een expliciet milieu-gerelateerde prikkel wel nodig kunnen zijn om het effect van biosferische waarden op oordelen te versterken. Vervolgonderzoek is nodig om na te gaan wanneer waarden wel of niet expliciete prikkels nodig hebben om doeleffecten te veroorzaken.

Het “halo” effect op beoordelingen van duurzame producten dat in dit proefschrift werd aangetoond suggereert dat de effecten van doelen vaak versterkender kunnen zijn dan verwacht. Er lijkt sprake te zijn van twee beoordelingsfasen. Ten eerste beoordelen mensen producten op basis van de gevolgen die deze producten hebben voor hun belangrijke doelen. Vervolgens kan de valentie van deze beoordeling de oordelen over verschillende specifieke producteigenschappen kleuren, zelfs als deze eigenschappen niets met iemands doelen te maken hebben. Op basis van de correlaties tussen de algemene doelen van mensen (ofwel waarden) en hun oordelen over duurzame producten kunnen we echter geen definitieve conclusies trekken over causale verbanden tussen doelen, de algemene beoordeling, en de oordelen over specifieke producteigenschappen die niet zijn gerelateerd aan doelen. Vervolgonderzoek is nodig om deze causale verbanden te testen.

Implicaties voor waardentheorieën

Waarden worden gedefinieerd als algemene doelen die mensen nastreven in hun leven (Hitlin & Piliavin, 2004; Schwartz, 1992; 1994). Waardentheorieën doen echter geen uitspraken over hoe deze doelkwaliteit van waarden de effecten van waarden op oordelen kunnen beïnvloeden. Door waarden expliciet als doelen in de betekenis van doeltheorieën te zien, kunnen wij beter verklaren hoe waarden invloed hebben op oordelen over duurzame producten.

Uit ons onderzoek blijkt dat expliciete prikkels niet altijd nodig zijn om waarden te activeren en hun effecten op beoordelingen te versterken. Onze veronderstelling dat chronisch toegankelijke overkoepelende doelen (ofwel sterke waarden) situatie-specifieke doelen kunnen versterken ook als er geen sterke omgevingsprikkels aanwezig zijn is dus bevestigd. Wij vergeleken de effecten van expliciete en subtiele omgevingsprikkels op oordelen over duurzame levensmiddelen (Hoofdstuk 3). Voor de *expliciete* omgevingsprikkel vroegen wij deelnemers om zinnen te maken van verschillende woorden, waarbij sommige woorden gerelateerd waren aan het milieu (Srull & Wyer, 1979). Voor de *subtiele* omgevingsprikkel hebben we mensen blootgesteld aan duurzame producten. Wij vonden dat duurzame levensmiddelen waarden konden activeren, waardoor de beoordeling van deze levensmiddelen werd beïnvloed door doeleffecten. Een expliciete omgevingsprikkel had geen additioneel effect op de relatie tussen waarden en de oordelen over duurzame producten. Vervolgonderzoek is nodig om na te gaan welke factoren de sterkte van omgevingsprikkels bepalen (met andere woorden: hoe subtiel of expliciet de prikkels zijn). Daarnaast is het belangrijk om te onderzoeken hoe sterk omgevingsprikkels moeten zijn om verschillende waarden te activeren en doeleffecten te veroorzaken.

Uit onze resultaten blijkt dat de effecten van waarden op oordelen kunnen verschillen voor verschillende soorten producten. De overkoepelende doelen die men nastreeft bepalen welke gevolgen men verwacht van verschillende producten voor hun waarden en de daarvan afgeleide doelen. Zogenaamde "normatieve" producten, die mensen in staat stellen hun normatieve doelen te vervullen, werden bijvoorbeeld door deelnemers als milieuvriendelijker beoordeeld dan zogenaamde "hedonische" producten, die mensen vooral in staat stellen om hun hedonische doelen te vervullen (Hoofdstuk 3). Meer specifiek bleek dat mensen met sterke biosferische waarden positiever oordelen over "normatieve" duurzame producten, terwijl biosferische waarden geen invloed hadden op de oordelen van "hedonische" duurzame producten (Hoofdstuk 3). Waardentheorieën zouden rekening met dit soort doeleffecten moeten houden, in plaats van impliciet aan te nemen dat waarden oordelen over duurzame producten altijd op dezelfde wijze beïnvloeden. Ons model verklaart waarom sterke biosferische waarden soms een positief effect op de oordelen over duurzame producten hebben en soms niet: dit hangt af van de mate waarin het betreffende product mensen in staat stelt hun doelen te behalen. Verder vonden wij dat verschillende energiebronnen anders werden beoordeeld, ook al worden ze allemaal gepresenteerd als duurzaam, vanwege de verschillende gevolgen van deze energiebronnen voor waarden en de daarvan afgeleide doelen van mensen (Hoofdstuk 4). Vervolgonderzoek is nodig om na te gaan of onze resultaten gerepliceerd kunnen worden met andere producten. Er zijn bijvoorbeeld meer energiebronnen die gepresenteerd worden als (relatief) duurzaam, zoals aardgas en het nu veel besproken schaliegas. Het is interessant om te onderzoeken wat voor gevolgen mensen verwachten van deze energiebronnen voor hun waarden en doelen en hoe ze daarmee over deze energiebronnen oordelen.

Ook het “halo” effect van waarden op productoordelen heeft belangrijke implicaties voor waardentheorieën. Uit ons onderzoek blijkt dat waarden oordelen over verschillende producteigenschappen kunnen beïnvloeden, zelfs als deze eigenschappen niet heel belangrijk zijn voor mensen gezien hun waarden (Hoofdstuk 3 en 5). De effecten van waarden kunnen dus verder strekken dan vaak wordt verwacht. Wij veronderstellen dat mensen duurzame producten eerst beoordelen op basis van welke gevolgen ze hebben voor hun waarden en de daarvan afgeleide doelen. Vervolgens zal deze algemene indruk beïnvloeden hoe mensen oordelen over tal van specifieke producteigenschappen. Op basis van de correlaties tussen waarden en oordelen over duurzame producten kunnen wij niet concluderen of oordelen over specifieke producteigenschappen de algemene beoordeling beïnvloeden of dat zij enkel een gevolg zijn van deze algemene beoordeling op basis van iemands waarden. Vervolgonderzoek is nodig om deze causale verbanden te testen.

Praktische implicaties

Ons basisidee is dat mensen producten beoordelen op basis van de mate waarin deze producten hen in staat stellen om hun doelen te bereiken, en dat de sterkte van doelen in een situatie wordt bepaald door omgevingsprikkels en de waarden die men belangrijk vindt. Duurzame producten zijn ontwikkeld om milieuproblemen te verminderen maar tegelijkertijd brengen ze vaak (korte-termijn) kosten met zich mee (bijv. hoge prijs, ongemak). Daarom worden deze producten waarschijnlijk positiever beoordeeld door mensen met sterke normatieve (in dit geval milieu) doelen, terwijl ze waarschijnlijk minder positief worden beoordeeld door mensen met sterke hedonische doelen of winstdoelen. Dat betekent dat we positieve beoordelingen van duurzame producten kunnen bevorderen door normatieve (en meer specifiek milieu) doelen te versterken. Maar hoe kunnen normatieve doelen worden versterkt? Wij veronderstellen dat interventies gericht moeten worden op

twee belangrijke factoren die de sterkte van doelen in een situatie bepalen, namelijk omgevingsstimuli en waarden.

Om milieudoelen te versterken, kunnen omgevingsprikkels die normatieve doelen stimuleren meer opvallend of sterker worden gemaakt, terwijl omgevingsprikkels die hedonische doelen of winstdoelen stimuleren minder opvallend of zwakker kunnen worden gemaakt. Vaak worden niet milieu-gerelateerde argumenten gebruikt om duurzame producten aan te prijzen. Er wordt bijvoorbeeld benadrukt dat duurzame levensmiddelen lekker zijn of dat het gebruik van hernieuwbare energie op de lange termijn goedkoper zal zijn. Maar deze argumenten appelleren vooral aan hedonische doelen en winstdoelen en kunnen dus ook deze doelen versterken. Als hedonische doelen of winstdoelen sterk zijn, zullen mensen duurzame producten vooral positief beoordelen als deze hen in staat stellen hun hedonische of winstdoelen te bereiken. Men oordeelt dan bijvoorbeeld positief over duurzame producten die goedkoop of lekker zijn. Maar als duurzame producten deze positieve eigenschappen verliezen (bijvoorbeeld niet meer goedkoop zijn), zal men minder positief oordelen over duurzame producten. Bovendien is het onwaarschijnlijk dat mensen met sterke hedonische doelen of winstdoelen ook andere duurzame producten positief gaan beoordelen, omdat deze producten deze voordelen vaak in mindere mate hebben. Als mensen sterke normatieve (milieu)doelen hebben, is de kans groot dat ze duurzame producten positief gaan beoordelen (zolang het duidelijk is dat deze producten hen in staat stellen om hun milieudoelen te bereiken) en zich minder laten leiden door andere producteigenschappen zoals smaak en prijs. Sterke normatieve (milieu)doelen kunnen dus tot consistente positieve oordelen over tal van duurzame producten leiden. Om te zorgen dat vooral normatieve doelen worden versterkt, kan bij de presentatie van duurzame producten de nadruk worden gelegd op hun positieve gevolgen voor het milieu en voor de samenleving. Daarnaast kunnen ook andere omgevingsprikkels de sterke van doelen

beïnvloeden. Normatieve (milieu)doelen kunnen bijvoorbeeld verzwakt worden terwijl de winstdoelen versterkt kunnen worden als er grote nadelen kleven aan het gebruik van duurzame producten (bijvoorbeeld een groot prijsverschil tussen duurzame en conventionele producten). Het verminderen van deze nadelen kan de winstprikkels minder sterk maken. Om vervolgens normatieve prikkels te versterken, kunnen duurzame producten als “duurzaam” in plaats van bijvoorbeeld “in prijs verlaagd” gepresenteerd worden.

Uit ons onderzoek blijkt dat milieudoelen sterker zullen zijn als mensen sterke biosferische waarden hebben, zelfs als er geen expliciete milieu-gerelateerde omgevingsprikkels aanwezig zijn (Hoofdstuk 3, 4, en 5). Bovendien vonden wij dat zelfs wanneer duurzame producten, zoals hernieuwbare energie, meer kosten met zich mee brengen, mensen met sterke biosferische waarden deze producten relatief positief beoordeelden. Dit gold ook voor de individuele (hedonische of winst) gevolgen van deze producten (Hoofdstuk 5). Sterke biosferische waarden kunnen dus tot consistente positieve oordelen over veel duurzame producten leiden. Maar hoe kunnen wij de invloed van biosferische waarden op beoordelingen van duurzame producten vergroten? Volgens ons model moeten biosferische waarden in een bepaalde situatie geactiveerd worden. Vervolgens moet het duidelijk zijn voor mensen dat duurzame producten hen in staat stellen om hun milieudoelen te bereiken.

De bovengenoemde argumenten over de smaak en/of prijs van duurzame producten kunnen hedonische en egoïstische waarden activeren, terwijl milieu-gerelateerde argumenten biosferische waarden kunnen activeren. Door het benadrukken van de effecten van producten op het milieu is het mogelijk om deze producten als normatieve omgevingsprikkels te laten werken. Dit is vooral relevant voor nieuwe producten, zoals nieuwe soorten van hernieuwbare energie. Door publieke discussies te voeren over de

effecten van (nieuwe) producten op het milieu kunnen nieuwe normatieve omgevingsprikkels in onze samenleving worden gecreëerd.

Bovenstaande roept een andere belangrijke vraag op, namelijk of we de sterkte van waarden kunnen veranderen. Hoewel er wordt aangenomen dat waarden van mensen relatief stabiel zijn, laten sommige studies zien dat het relatieve belang van waarden kan veranderen, bijvoorbeeld als gevolg van grote veranderingen in iemands leven zoals het verhuizen naar een ander land (Bardi & Goodwin, 2011; Lönnqvist, Jasinskaja-Lahti, & Verkasalo, 2011). Als de milieuproblemen en de effecten ervan op onze manier van leven veel worden besproken, zou dat wellicht biosferische waarden op de lange termijn kunnen versterken. Versterking van biospherische waarden is dus afhankelijk van de publieke discussie en daarbij vooral van steekhoudende argumenten van wetenschappers over de nadelige gevolgen van bepaalde productieprocessen, producten of handelingen (Lindenberg & Steg, 2013b). Vervolgonderzoek is nodig om na te gaan of en hoe biosferische waarden versterkt kunnen worden.

Wij vonden dat niet alle producten die als duurzaam worden gepresenteerd positief beoordeeld worden door mensen met sterke biosferische waarden. Dit komt omdat niet alle duurzame producten door mensen als geschikt worden gezien voor het bereiken van hun milieudoelen. “Hedonische” levensmiddelen werden bijvoorbeeld door deelnemers als minder milieuvriendelijk gezien dan “normatieve” levensmiddelen (Hoofdstuk 3). Wanneer producten als duurzaam worden gepresenteerd, gaan mensen met sterke biosferische waarden hun oordelen over deze producten vooral baseren op de gevolgen die deze producten hebben voor het milieu. Dat kan dus effectief zijn voor het promoten van “normatieve” producten, maar waarschijnlijk is het minder of zelfs niet effectief voor het promoten van “hedonische” producten. “Hedonische” producten kunnen waarschijnlijk positiever beoordeeld worden als de hedonische doelen van mensen worden versterkt,

bijvoorbeeld door deze producten als “lekker” te presenteren. Echter, zoals eerder genoemd, het versterken van hedonische doelen en winstdoelen zal waarschijnlijk niet tot consistente positieve oordelen over andere duurzame producten leiden. Dat komt doordat de effecten van deze doelen op productoordelen zeer afhankelijk zijn van de voordelen die deze producten hebben voor de consument, terwijl veel duurzame producten deze voordelen vaak in mindere mate hebben. Op basis van ons onderzoek kunnen we echter niet concluderen dat sterke milieudoelen nooit leiden tot positieve oordelen over duurzame “hedonische” producten. Wellicht kunnen “hedonische” producten als milieuvriendelijker gezien worden als ze heel vaak als duurzaam worden gepresenteerd of als ze samen met duurzame “normatieve” producten gepresenteerd worden. Vervolgonderzoek is nodig om dit te testen.

Het “halo” effect leidt er toe dat mensen hun oordeel over specifieke eigenschapen van duurzame producten baseren op hun algemene indruk van deze producten (die is bepaald door hun waarden), zelfs als ze deze eigenschappen niet heel belangrijk vinden. Mensen met sterke biosferische waarden kunnen bijvoorbeeld “normatieve” levensmiddelen als lekker en “hedonische” levensmiddelen als minder lekker beoordelen. Maar mogelijkerwijs heeft dit niets te maken met de smaak van producten. Dit kan vooral veroorzaakt worden door hoe milieuvriendelijk deze producten worden gezien, waardoor mensen het betreffende product op veel aspecten positiever gaan beoordelen. Het verbeteren van de smaak van “hedonische” levensmiddelen zal deze oordelen dus waarschijnlijk niet veranderen. Daarnaast blijkt uit onze resultaten dat vooral mensen met sterke egoïstische waarden hernieuwbare energie minder positief beoordeelden, inclusief de gevolgen voor het milieu (Hoofdstuk 5). Mensen met sterke egoïstische waarden hechtten vooral belang aan de individuele gevolgen van energiebronnen en niet zozeer aan de gevolgen voor het milieu. Dit suggereert dat mensen met sterke egoïstische waarden

hun minder positieve oordelen over de milieueffecten van hernieuwbare energie baseren op hun algemene negatieve indruk van deze energiebron. Argumenten over de milieu-gerelateerde voordelen van hernieuwbare energie zullen waarschijnlijk niet leiden tot een verandering in de oordelen van mensen met sterke egoïstische waarden. Deze resultaten maken duidelijk dat het belangrijk is om rekening te houden met de doelen en vooral de waarden van mensen om te begrijpen waarom mensen duurzame producten op een bepaalde manier beoordelen. Op basis hiervan kunnen duurzame producten aangepast worden zodat ze beter voldoen aan de belangrijke doelen van mensen. Als mensen sterke hedonische doelen of winstdoelen hebben, kunnen hun positieve beoordelingen gestimuleerd worden door duurzame producten meer compatibel te maken met deze doelen. Dat garandeert echter niet dat ook andere duurzame producten positief worden beoordeeld. Vooral normatieve (milieu)doelen kunnen leiden tot consistente positieve oordelen over veel duurzame producten. Daarom is het belangrijk om deze doelen blijvend te versterken.

Conclusie

Samenvattend hebben wij in dit proefschrift aangetoond dat oordelen over duurzame producten bepaald worden door belangrijke doelen van mensen. Duurzame producten worden vooral positief beoordeeld wanneer mensen sterke normatieve (milieu)doelen hebben en wanneer het duidelijk is dat duurzame producten hen in staat stellen om deze doelen te bereiken. Milieudoelen zijn sterker wanneer mensen sterke biosferische waarden hebben. Dan kunnen duurzame producten als omgevingsprikkels werken die deze doelen versterken en doeleffecten op oordelen oproepen. Maar duurzame producten kunnen ook hedonische doelen (zoals plezier beleven) of winstdoelen (zoals geld besparen) oproepen, vooral als mensen sterke hedonische of egoïstische waarden hebben. Duurzame producten worden vervolgens beoordeeld op basis van de mate waarin ze mensen in staat stellen om

deze doelen te bereiken. Dezelfde duurzame producten kunnen dus verschillend beoordeeld worden, afhankelijk van hoe goed de betreffende producten mensen in staat stellen hun doelen te bereiken. Door rekening te houden met doelen en vooral waarden van mensen kunnen wij beter begrijpen waarom men duurzame producten op een bepaalde manier beoordeelt. Daarnaast kunnen wij voorspellingen doen over welke productoordelen door het “halo” effect zijn gekleurd. Dit zijn oordelen over producteigenschappen die niet heel belangrijk zijn voor mensen in het licht van hun doelen en die hun algemene beoordeling van duurzame producten wellicht nauwelijks beïnvloeden. Wij hopen dat dit proefschrift verder onderzoek naar oordelen over duurzame producten zal bevorderen. Het begrijpen van de invloed van doelen op oordelen van duurzame producten is belangrijk om te bevorderen dat mensen positiever gaan oordelen over duurzame producten.

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